

heads. I should mention, however, that this field had also been deep-ploughed the previous year.

"With these results, I conclude that the manure is quite a success, in so far as it improves the soil and stimulates the plants; but I doubt if it could be laid down sufficiently cheaply to give a satisfactory financial result to the cultivator."

5. The following report from Mr. Nago Rao Jeyá Krishná, the Assistant to the Cotton Commissioner at Oomraotee, confirms very much the views expressed by Mr. Dunlop as to the late arrival of the manure affecting the experiment:

"I have the honor to report that about 550 lbs. of Compton's patent chemical manure were supplied to me by Messrs. Stearns, Hobart and Company; but, unfortunately, the manure reached the Oomraotee model farm towards the end of August, when the cotton plants were in flower, and the manure was, therefore, applied only as a 'top dressing.' Moreover, there was no water at the farm to irrigate the manured parts, and consequently the result was not as favorable as it was expected. The manured plants looked a little stronger and better than the unmanured."

6. The experiments above referred to were undertaken during the season of 1869-70. Instructions were issued to supply the farm in the Wurdah Valley with 5 cwts. of this guano for experiment. The supply arrived so late that, in accordance with my instructions, the guano was reserved until last season, when it was applied at the Mudnee Farm under the direction of Mr. Noble.

7. Here, too, the experiment was most unfortunate. The River Bore, across which a dam had been thrown in accordance with a scheme for irrigating the model farm, overflowed and inundated the adjoining lands, including that which had been prepared with this manure. The results are described in the following extract from Mr. Noble's report:

"The effects of the manure at first were very apparent, causing the young seedlings to grow up sturdier and quicker than the others. But, after the growing plants had been up for a short while, nearly the whole of the farm was inundated twice, the second flood occurring about eight days after the first. All the manured portion was completely flooded, and no doubt the greater portion of the manure must have been carried away with the flood, or perhaps distributed over all the land which was flooded. In consequence, I do not think it would be fair to take the manured portion as a fair sample of manured cotton. The plants in this piece (manured with the cotton manure) are not superior to some other parts of the farm. One portion of this piece was completely re-sown ('bukhars' having first been passed over), and this part is superior to the other which was not re-sown.

"From what I have written above, and in my weekly reports at the time the floods occurred, I think you will agree with me that I am not well able to speak positively about what effects have resulted from the use of the manure. If this manured portion had turned out superior to the rest of the farm, then, of course, allowing a difference for different kinds of soil, it would have been apparent that this superiority was due to the use of the manure, but such is not the case. Some parts of it are, perhaps, equal to the other parts of the farm, but there are also some parts of it decidedly inferior."

8. It must, then, be admitted that the manure has not yet had a fair trial. In fact, the experiments were undertaken under such manifest disadvantages that, as already noticed, no special record was kept on the subject. I was therefore anxious to try its effects again this season; but, on application to the agents in Bombay, I learnt that none of the manure is available in Bombay. Should His Excellency the Governor General in Council desire it, arrangements can be made to ensure a supply being obtained early next year, so as to admit

of the fertiliser being well ploughed into the soil before the seed is sown, and the effect thus being thoroughly tested next season.

9. Judging from the accompanying analysis of the manure, and of the black cotton soil of the Deccan, there can, I think, be little doubt that the manure, if properly applied, would benefit the cotton fields of the Berars, although exactly to what extent it is not possible to predict, by giving back to the soil many of those fertilizing ingredients which the cotton plant absorbs. The following is the analysis of the manure as given by Messrs. Compton and Company :

Ammoniacal organic matter	...	...	...	23.5
Alkaline salts	...	...	...	9.5
Phosphate of lime and magnesia	...	...	...	17.5
Sulphate of lime	...	...	...	7.0
Carbonate of lime and magnesia	...	...	...	18.5
Vegetable organic matter	...	...	...	9.0
Silicate alumina and sand	...	...	...	5.0
Water (hygroscopic).	...	...	...	10.0
TOTAL				100.0

Ansted's analysis of the "*regur*" or black cotton soil of the Deccan is as follows :

Silica	...	...	...	48.20
Alumina	...	...	...	20.30
Carbonate of lime	...	...	...	16.00
Carbonate of magnesia	...	...	...	10.20
Oxide of iron	...	...	...	1.00
Water and organic matter	...	...	...	4.30
TOTAL				100.00

10. The chief question involved in the proposed use of this and other imported fertilisers rests, however, on the point whether they can or cannot be used by the cultivators of the Berars at a profit, *i. e.*, whether, after deducting the expenses connected with the purchase and application of the manure, the extra yield of cotton resulting from the use of the fertiliser will leave a balance of profit in the hands of the ryot, sufficient to encourage him to adopt this improved system of farming.

11. Another question also is involved which will be noticed at the close of this report, and that is, whether manure to any great extent can safely be used without a supply of water ready at hand to be applied in the event of the rain-fall failing.

12. Although, for the reasons already stated, it is not in my power to give reliable figures shewing the actual yield of cotton on the lands at the farms which enjoyed the advantage of the manure, compared with the yield on those lands to which no manure was applied, still I am able to give the cost of the manure as laid down on our farms, and from this it may be judged whether there is a fair probability of this and other imported chemical manures being generally adopted in the Berars.

13. The cost of this manure delivered at Bombay or Calcutta is £8 per ton. The railway carriage on goods of the first or lowest class is 9.5 pie per ton per mile for distance over 400 miles, with a terminal charge of Rs. 2-1-9, and in this class fertilisers would apparently be included. Now Oomraotee, which is about the centre of the Central Provinces and Berar cotton field, is 438

miles from Bombay, whilst Nagpore, which is quite at the Northern extremity, is 539 miles distant from that port; Mulkapore the nearest point being 327 miles distant from Bombay. It will not then be unfair to calculate that if this manure were generally adopted in the cotton-growing country, then that, in addition to the cost of £8 per each ton at the sea port, an additional charge of about pies 9·5 × 400 pies (the rate per ton per mile multiplied by the number of miles which the manure would have to be carried) or Rs. 19-12-8 *plus* a terminal charge of Rs. 2-1-9, making a total charge of Rs. 21-14-5 for railway freight, would have to be incurred for each ton laid down in Central India, bringing the total cost of a ton of manure up to Rs. 101-14-5.

14. Now, supposing that this manure was applied to the soil at the rate of 2 cwts. per acre (in America much greater quantities are used), the cost of the manure per acre delivered at the cotton field in Central India, would be Rs. 10-3-0½. To this, again, has to be added the cost of spreading the manure and working it into the soil, &c. This, from a careful estimate that has been framed and checked by the actual charges incurred in applying manure of a somewhat similar description last season, amounts to Rs. 2-2 per acre, calculated as follows :

	Rs.	A.	P.
Spreading 2 cwts. of manure over one acre of ground, four men at four annas per diem	1	0	0*
Ploughing the manure into the ground with "bukhur" (one bukhur per one day)	1	0	0
Carting 2 cwts. of manure to the field, say on an average	0	2	0

15. The estimate is framed for land near the railway line. The cartage to places at a distance would of course be more expensive.

16. The total cost to the cultivators of the 2 cwts. of manure up to the time of its being ploughed into the soil would then be as follows :

Cost of 2 cwts. of manure sufficient to sow one acre of cotton land.

	Rs.	A.	P.
Cost in Bombay	8	0	0
Railway charges	2	3	0·5
Cost of ploughing into the land	2	2	0
TOTAL	12	5	0·5

17. To ensure the cost of the manure being repaid to the cultivator, it would be necessary, then, that the acre to which the manure was applied should bear a certain number of pounds clean cotton in excess of that produced by the neighbouring land, which did not enjoy the advantage of the manure, and on which thus the expenditure of Rs. 12-5-0·5 shown above would not have been incurred.

18. Given the price of cotton per pound in the cotton districts, it becomes then a not very intricate Rule of Three sum to determine how many additional pounds of cotton it would be incumbent on the one acre of manured land to grow in excess of that grown by its neighbour, the less favoured acre, to enable the cultivator to cover the expenses of the experiments. Now the price of cotton has varied very considerably during even the last few years. I put the prices that were touched during the American war out of the question, as we are not likely to see them again at present.

19. Now the price of cotton per pound in Liverpool, by which the price of the staple at the markets of Bombay and up-country is generally governed,*

* I say generally, because sometimes from the action of speculators or one cause and another, the price of cotton in Bombay and the up-country markets is actually higher than in Liverpool!

stood during the past cotton-selling season, i. e., from December to the end of May, as follows :

PRICE PER POUND.

H. denotes the highest quotation, L. the lowest.

Months.	Fair Dhollera.		Fair Oomraotee.		Fair Hingunghât.	
	H. d.	L. d.	H. d.	L. d.	H. d.	L. d.
December	6 $\frac{7}{8}$	6 $\frac{1}{2}$	6 $\frac{5}{8}$	6 $\frac{1}{2}$	7 $\frac{1}{4}$	7 $\frac{1}{8}$
January	6 $\frac{1}{2}$	5 $\frac{7}{8}$	6 $\frac{5}{8}$	6 $\frac{1}{2}$	7 $\frac{1}{4}$	7 $\frac{1}{8}$
February	6 $\frac{1}{4}$	6 $\frac{1}{8}$	6 $\frac{5}{8}$	6 $\frac{5}{8}$	6 $\frac{5}{8}$	6 $\frac{5}{8}$
March	6 $\frac{1}{8}$	5 $\frac{7}{8}$	6 $\frac{1}{4}$	6	6 $\frac{5}{8}$	6 $\frac{1}{2}$
April	6 $\frac{1}{8}$	5 $\frac{7}{8}$	6 $\frac{1}{4}$	5 $\frac{7}{8}$	6 $\frac{5}{8}$	6 $\frac{1}{4}$
May	1 $\frac{1}{16}$	5 $\frac{3}{4}$	6 $\frac{1}{8}$	5 $\frac{7}{8}$	6 $\frac{1}{4}$	6

20. Since, then, the market has improved, and Fair Dhollera was quoted at Liverpool on the 15th instant at 7 $\frac{7}{16}$ d. per pound. The cotton of our Provinces is, as will be seen from the above statement, worth rather more than the "Fair Dhollera," the standard quotation; for instance, when Fair Dhollera stood at 6 $\frac{1}{16}$ d. Fair Oomraotee was selling at 6 $\frac{1}{8}$ d., Fair Hingunghât at rather a higher figure again at 6 $\frac{1}{4}$ d.

21. The price of cotton in the Berars from December to the end of May, when the selling season closed, has varied in a manner corresponding, cotton being sold at Oomraotee (the sales at which market I propose to take as the standard for my calculation) from Rs. 52 per bojah of Rs. 260 to Rs. 48 per bojah of the same weight. This year prices have admittedly been very low. During the present month, however, consequent on the Liverpool quotations, the price rose to Rs. 63 per bojah.

22. I propose then taking Rs. 60 per bojah as a fair average, and at this price the Berar cultivator gets, if we value the rupee at 2s., a trifle more than 5 $\frac{1}{2}$ d. or 3 annas 8 pie per pound for his cotton, the exact figure being 5.542d. (with exchange at 1s. 10 $\frac{3}{4}$ d. it is 5.25d.).

23. The Liverpool price corresponding with cotton selling at Oomraotee at Rs. 60 a bojah or 5.25d. would be, roughly speaking, about 7.366d. per pound,* which, considering the present condition of the trade, may, I think, be accepted as a fair price on which to base the following calculation.

* It may be satisfactory to show how this figure is arrived at. Three bojahs of 260 lbs. each equal to a Bombay candy of 784 lbs. (or two bales of 3 $\frac{1}{2}$ cwt. each); the dry Berar cotton gaining some thing small in weight in the damp climate of Bombay, and the difference of 4 lbs. being thus accounted for.

The price of one candy of 3 bojahs (784 lbs.) at Rs. 60 equals to Rs. 180, but to this has to be added the expenses incident on sending this cotton to Bombay, agency, pressing charges, freight, &c. These charges are taken at about Rs. 34 a candy, and the price of a candy of Berar cotton laid down in Bombay is thus brought up to Rs. 214 per candy of 784 lbs. Now the equivalent Liverpool quotation for Oomraotee cotton, costing in the Oomraotee market Rs. 60 per bojah (or 5.25 to the cultivator) and selling in the Bombay market at Rs. 214 per candy, would be taking exchange at 1s. 10 $\frac{3}{4}$ d. per rupee, and freight (Suez Canal) at £3 per ton, and allowing the usual charges for commission, insurance, &c., 7.366d. per pound. The calculation will vary slightly according to exchange, freight, &c., but the above will be found nearly correct.

In fact, when the Manchester spinner can afford to give 7.366d. for "Fair Oomraotee," the cultivator in Berar gets about 5 $\frac{1}{2}$ d.; of this sum, the balance of upwards of 2d. being absorbed in the charges incurred in agency, freight, &c., between the Oomraotee cotton market and the factory in Manchester. I have thought it desirable to work out the figures, and give the details in an Appendix.

24. The ryot then sells his cotton at 3 annas 8 pie a pound. The manure costs Rs. 12-5-0·5 per acre. To ascertain then the number of additional pounds of cotton that the manured acre must yield to repay the cost of experiment, the following sum has to be worked out :

$$\begin{array}{rcl} \text{Rs. A. P.} & \text{Rs. A. P.} & \text{lb. lbs.} \\ 0 \ 3 \ 8 & : \ 12 \ 5 \ 0\cdot5 & : : \ 1 = 54 \end{array}$$

which gives, as will be seen above, 54 lbs. of cotton as the result.

25. It will be seen then that, for the manure to repay the expenditure, it would be necessary that the acre so manured should yield 54 lbs. more cotton than an acre of unmanured land of similar quality. There would also be a corresponding quantity of seed in excess; but, as the additional seed would have to be put against the additional expense of cleaning the increased quantity of cotton, it may be excluded from the calculation.

26. Now, as the Berar cotton lands in a good season bear from 80 to 100lbs. of cleaned cotton to the acre, it would not be an extraordinary success for a fertiliser to achieve to increase the produce by, say, 50 per cent., and it will be seen from the above calculation that such an increase would about pay the cost of the experiment. This would of course be a very satisfactory result for the trade, as the supply of the raw material would be increased, but hardly gratifying to the cultivator who, in reward for some extra trouble, risk, and anxiety, would only just be able to pay expenses incurred. If the crop were doubled by the manure the ryot would then make a profit of about Rs. 12 per acre. But I doubt if this effect could be expected from the fertilisers as a continuance. It is however to be remembered that in the Berars the experiment is weighted by a railway freight of Rs. 2-3-0·5, or 18 per cent. having to be paid on the manure; and if this charge be deducted, as would be done in the case of an experiment undertaken near the sea coast, then, with cotton selling on the spot at Rs. 60 per bojah of 260lbs., an extra yield of not more than 44lbs. would be required to cover the expense of the experiment, and thus an increased yield of 50lbs. would give the cultivator a profit of Rs. 1-6 per acre.

27. I fear, however, these figures, though not, perhaps, discouraging, are not very hopeful for the imported manure. No one feels more strongly than I do the importance of trying to increase the yield per acre of our cotton tracts. But I believe that we must look to a cheaper fertiliser than that which can be imported from abroad, and with this object experiments are being made with *poudrette*, prepared on the dry earth system, and with several other descriptions of manures.

28. Native cultivators are, it is well known, fully alive to the benefit resulting from the use of manure. In the Berars the patches on which irrigated crops are raised, receive as much of the cattle manure as can be spared after the quantity set aside for fuel has been supplied. But where irrigation is not available, but little manure is used. This arises from two causes,—the one, that but little manure is available; the second, that the application of manure in any considerable quantity to land which cannot be artificially watered, in the opinion of the Natives who are not bad judges in such a matter, is attended with some risk.

29. The subject is explained in the following paragraphs of my report for 1868-69, paragraphs 90, 91 and 92, page 73, which for facility of reference are quoted below :

Para. 90. The success of the experiments with manures in America, and the possibility of providing a cheap manure being borne in mind, the great stumbling block already hinted at, which lies across the path of the general adoption of a system of manuring the cotton lands, has now to be

noticed; and if the importance of increasing the cotton supply has been satisfactorily explained, then the necessity of removing this obstacle will, I hope, be apparent.

91. It has been noticed in a former paragraph that a Native, when advised to use manure, will answer that it is a very risky measure; that its success will depend on the season; that manure and water must go together; that in a wet season a manured field will give a splendid return; that if the rain fails, the cotton, which without manure would have successfully weathered the draught, will be an utter failure, the manure exciting the plant, burning it up, or driving it to wood; that he is a poor man dependant altogether on his fields; that, even if he had the manure, he cares not to run the risk; and that as with exotic seed he prefers a certainty, with moderate returns to an uncertainty. And, perhaps, he cannot be blamed. Nor would it be wise, having regard to the extreme caprice exhibited by the last few rainy seasons in this part of India, to advocate any general application in considerable quantities of manure. Had this been done last season, the result would, I believe, have been very different from what I have now had the pleasure of recording, and the crop would hardly have successfully weathered a season so extremely trying to all classes of cultivation. For without a sufficient supply of water, as the cultivators say, manure, there is good cause to believe, destroys the crops. But give the plant plenty of manure and plenty of water, and the result is widely different, the crop will be a magnificent one. Therefore, then, if we wish to increase our cotton supply, we must, I believe, call irrigation also to our aid. It will not do to manure the fields and risk a failure of the crops from a scanty rain-fall. We must insure the outturn, and have water at hand ready to be turned on if necessary—the works being undertaken by Government, and the cultivator paying an annual premium on the insurance in the form of a water-rate.

92. I am not unprepared for many arguments against the necessity of irrigation. "Indian cotton does not require irrigation," it has often been said, and to this I quite agree, that is to say, to get the cotton of the quality and in the quantity we now do, irrigation is not certainly required. The last season is the best proof of *that*. But then the question is, are we to be content with the present results? Are we to be content with getting 50 or 80 lbs. of somewhat inferior cotton to the acre? If the answer is that we are morally bound to do our very best to increase the supply, then I altogether doubt any results being achieved without the assistance of the fertiliser; and the fertiliser entails irrigation; and I believe it will be found in the long run that irrigation we must have.

30. Up to the present moment, however, the schemes for irrigating the cotton lands in the Central Provinces and the Berars, have not, so far as I am informed, progressed beyond the preliminary stages, and until more progress is made in this respect, we cannot, I fear, do much for increasing the yield of cotton in Central India by the use of fertilisers.

31. The reports I am now receiving from Berar show that this season the rain has held off, and that the crop is suffering. If the rain returns soon, I hope that our sturdy little cotton plants will yet pull through. But had the cotton-growing tracts been heavily manured, there would, I think, have been little hope of the plants, stimulated by the manure, making a stand against the ill effects of the scarcity of rain.

32. It may be noted here that several experiments have been made during the past season with other descriptions of manure. I have purposely omitted any detail of the results in this report, which refers to the manure received from Australia.

Calculation—cost of Oomraotee Cotton laid down in Liverpool.

THE cost in Oomraotee and charges from thence to Liverpool are given approximately.

They will vary according to many circumstances that need not here be detailed.

Price at Oomraotee.

The cultivator sells his cotton in the Oomraotee market to the European agent for Rs. 60* a bojah of 260 lbs., *i. e.*, the ryot pockets 3 annas 8 pies per pound which, at 1s. 10 $\frac{3}{4}$ d. exchange, is equal to 5·25d. per pound.

The price realized by cultivators per pound there is 5·25d.

Charges between Oomraotee and Bombay.

The calculations are now made on the Bombay candy of 784 lbs., which equals three bojahs of 260 lbs. *plus* 4 lbs. minus difference gained in weight by Oomraotee cotton in the damp climate of Bombay—

	Rs.	A.	P.	Pence per pound.
Price of a candy of 784 lbs. of cotton at Oomraotee ...	180	0	0	or 5·25
Pressing in bales ready for shipment per candy (2 bales) ...	7	0	0	
Railway freight from Oomraotee to Bombay, including terminals on 784 lbs. (<i>plus</i> 40 lbs. tare) <i>i. e.</i> , on 824 lbs. at Rs. 1-11-6 per maund of cotton of 82 lbs. ...	17	0	0	
Petties, discount on Bombay bill, &c. ...	2	0	0	
	206	0	0	
Commission at 4 per cent. ...	8	0	0	
Total cost of a candy laid down in Bombay ...	214	0	0	or 6·209d.

Thus, charges between Oomraotee and Bombay Rs. 34-0-0 or ·959d.

Charges between Bombay and Liverpool.

	Rs.	A.	P.	Pence per pound.
Price of a candy of 784 lbs delivered in Bombay, as shown separately ...	214	0	0	6·209
Brokerage at $\frac{1}{4}$ per cent. ...	0	8	7	
Shipping charges and petties ...	2	0	0	
Freight at £3 per ton ...	15	0	0	
English charges and fire insurance, 2 per cent. ...	2	0	0	
	Rs. 233	8	7	
Insurance at 2 $\frac{1}{2}$ per cent. ...	5	13	3	·807
	Rs.† 239	5	10	
Discount (one month and-a-half) at 1 per cent. ...	2	6	9	
Price at Liverpool (without profit) ...	241	12	7	7·016
Profit at 5 per cent. ...	12	1	5	·35
Total price in Liverpool Rs. ...	253	14	0	for or 7·366
(a)—Thus the ryot gets ...	5·25d.			
(b)—Charges from Oomraotee to Bombay (including Agent's commission) ...	·959d.			
(7)—Charges between Bombay and Liverpool ...	·807d.			
(8)—Add profit at 5 per cent. ...	·35d.			
	7·366d.			

* Rupees 60 per bojah is above the average price of the past season, which was, comparatively speaking, a bad one for the ryot, the price having ranged from Rs. 48 to Rs. 52 per bojah since the rise in the price of cotton at Liverpool: since June the price at Oomraotee is more than Rs. 60.

† Trade discount at 3 $\frac{1}{2}$ per cent. is generally given. I have not taken this into account.

ALLAHABAD,
COTTON COMMRS'S OFFICE;
The 22nd July 1871.

H. RIVETT-CARNAC,
Cotton Commissioner.

Resolution by the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 94-99 dated Simla, the 16th August 1871.

READ the following papers containing reports on experiments made with Compton's Patent Manure:

Home Department letters Nos. 4651 to 4659, dated 11th October 1870.
 From Government, North-Western Provinces, No. 1302A, dated 21st September 1870.
 From ditto ditto, No. 1131A, dated 15th July 1871.
 From Chief Commissioner of Oudh, No. 5243, dated 25th October 1870.
 From Secretary to Agri-Horticultural Society, Punjab, No. 15—115, dated 15th November 1870.
 From Government of Bengal, No. 4477, dated 17th November 1870.
 From ditto ditto, No. 1684, dated 8th May 1871.
 From H. Rivett-Carnac, Esq., Cotton Commissioner, Central Provinces and Berar, No. 3524, dated 18th July 1871.

OBSERVATIONS.—From the various reports of the experiments that have been made, it appears that, so far as this manure has yet been tried in India, it has not proved a success. It is not, however, impossible that its apparent failure may be due to some error in the methods of applying it, and a communication will be addressed to Messrs. Compton and Company on the subject.

ORDER.—Ordered, that a copy of this Resolution, of Mr. Carnac's Report in full, and of the précis of correspondence, be forwarded to Messrs. C. H. Compton and Company, and that they be invited to furnish Government with two tons of their chemical manure for further experiment, on the same terms as before, together with any remarks they may have to offer as to the probable causes of the unfavorable results of past experiments, and full and detailed instructions as to the best methods of employing the supply now asked for; also, to state what would be the lowest price per 100 tons for which they could deliver the manure free of all other charges at Calcutta, Madras, and Bombay, in the event of considerable quantities being at any time required; as even if future experiments should prove more successful than those hitherto undertaken, the possibility of largely utilizing this manure must depend chiefly on the price at which it can be delivered in India.

Ordered also, that a copy of this Resolution, Mr. Carnac's Report, and the précis of correspondence be forwarded to the Secretary to the Agri-Horticultural Society, Punjab, for information, and to the Governments of Bengal and the North-Western Provinces, and the Chief Commissioner of Oudh for information and communication to the societies, superintendents of public gardens, and private parties who have tried and reported on this manure.

Ordered also, that a copy of this Resolution and of the précis of correspondence be forwarded to the Cotton Commissioner of the Central Provinces and Berar.

Ordered further, that this Resolution, Mr. Rivett-Carnac's Report, and the précis of correspondence be published in the Supplement to the *Gazette of India*.

Introduction of the Ipecacuanha Plant into India.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 69, dated India Office, London, the 16th November 1870.

In continuation of my despatches numbered 27 and 52, and dated, respectively, the 20th of April and the 28th of July, on the measures taken for procuring a supply of ipecacuanha plants for introduction into India, I transmit to your Excellency in Council ten printed copies of a Report* by Dr. Christison, of Edinburgh, on the plants now being reared there for this purpose, under Mr. Macnab, of the Royal Botanical Gardens, and in the nurseries of Messrs. Lawson.

2. Since this letter was received, I have received with very deep regret the intelligence of the death of Dr. Anderson, Superintendent of the Botanical Gardens at Calcutta, to whom, on your recommendation, I had entrusted the conduct of this experiment. It will not be easy to provide a substitute for this able and zealous officer, but the progress which he had made, with the help of Dr. Christison and the other gentlemen mentioned before, has been so satisfactory that the safe conveyance to Calcutta of such plants as may be fit to be moved is now the chief difficulty. Dr. Thomas Farquhar, of the Bengal Medical Service, as you are aware, took an early interest in this experiment, and I have selected him for the duty of conveying such plants as are ready. I enclose a copy of the instructions addressed to him, and of the reply to Dr. Christison.

3. Dr. Hooker will still be ready to receive any plants at Kew which it may be found expedient to send to him, and to transmit them to India as opportunity may occur.

From D. R. CHRISTISON, Esq., to the Under Secretary of State for India,—dated 40, Moray Place, Edinburgh the 25th October 1870.

I REGRET to have to intimate to you, for the information of Her Majesty's Secretary of State for India, that Dr. Thomas Anderson, who is in charge of the preparations here for the introduction of the culture of the ipecacuan plant into India, has been for nearly two months so seriously ill as to have been unable to attend to any business. Although his state of health is improved, he continues to be wholly incapable of transacting business, and he has, therefore, requested me to report to you the progress of his preparations here.

This progress has not suffered from his illness, because fortunately the necessary measures for multiplying plants had been previously organized thoroughly by Mr. Macnab, Head Gardener of the Edinburgh Royal Botanic Garden, and also by Messrs. Lawson, Nurserymen.

I have carefully examined, on the 22nd, the plants in both places, and have to report that the progress made is eminently satisfactory.

In Messrs. Lawson's nursery stove there are now 110 healthy young plants reared from cuttings of specimens obtained by them from Belgium, and these plants are of such size that, if thought advisable, many of them might be transported to India in January next. There are also about 200 newly-risen plants from cuttings of others of the same age with these now mentioned. One plant only has flowered in Messrs. Lawson's stove.

In the Botanic Garden there are four sets of plants—

(1.) Forty plants somewhat farther advanced than the majority of those of Messrs. Lawson, which I have described as nearly ready for removal to India. Many of these have flowered, and their progress is such as to have induced Mr. Macnab to prepare them for the journey.

(2.) Sixty plants raised from cuttings obtained from the former set, younger therefore, but well forward, and very healthy and thriving to appearance. The originals of both these sets were plants obtained from the Continent, and probably identical in characters with those obtained by Messrs. Lawson.

(3.) Sixty thriving plants, nearly as far advanced as the last set, being the first produce of cuttings of the stems and roots of the plants sent to me last summer by Dr. Gunning, of Rio Janeiro, direct from Brazil.

(4.) One hundred and fifty younger plants, being a second set from the same stock, obtained from cuttings of the last set No. 3.

The plants of No. 3 and No. 4 present some differences in their form from those of the same ages of Nos. 1 and 2, as well as from those cultivated by Messrs. Lawson. It is probable that these differences depend on mere variety only. Several varieties of true ipecacuan root, besides spurious ones, are known in trade, especially on the Continent, and it is reasonable to infer that the several varieties of true root, which seem all equal in energy, may be the produce of corresponding varieties in the true species of plant.

It is unnecessary to state that great care must be taken in choosing the true species, and if possible, the best variety of it, for culture in India. On this point I have to observe that there can be no doubt of the genuineness of the plants sent by Dr. Gunning. The most elaborate description and best defined drawing of the plant as observed in Brazil are those of Von Martins, in his "*Specimen Materiae Medicæ, Brasiliensis, 1824*," re-printed from the ninth volume of the transactions of the Bavarian Academy of Sciences. In this treatise the author has described and figured also the several plants and roots of the spurious ipecacuans—an addition which gives facility and accuracy to the diagnosis. The plants sent by Dr. Gunning corresponded, so far as their characters were shown, precisely with the description and figure of Von Martins, and so do all the young plants, without exception, which have been raised from them. I also found the roots of Dr. Gunning's stock plants to be absolutely identical, in their rather remarkable characters, with the finest ipecacuan root of our shops. Mr. Macnab, therefore, proposes to confine for the present the further multiplication of plants to Dr. Gunning's stock. It is quite possible, however, that, in the progress of the plants to maturity, the differences in character now observable may so far disappear as to indicate variety unimportant in reference to the object of their culture.

It was Dr. Anderson's hope and intention to return to India in January next, by which time a considerable consignment of plants might have accompanied him. His illness, however, has been so severe, and not long ago even dangerous, that it is impossible for him to go out so soon. But both Mr. Macnab and Messrs. Lawson's Superintendent state that the plants will gain in hardiness and endurance of transport by more mature growth in their present situation.

At all events it will be a matter of great importance that they be not sent out to India except in custody of some skilful person, who will either see them to their actual destination there, or consign them into trusty hands on arriving at an Indian port.

From H. MERIVALE, Esq., C. B., Under Secretary of State for India, to DR. THOMAS FARQUHAR,—dated India Office, London, the 10th November 1870.

I AM directed by His Grace the Secretary of State for India in Council to refer to the representations made by you some time since to His Excellency the Governor General in Council and to this Department as to the importance of introducing into India a sufficient number of ipecacuanha plants in order to establish that valuable medicine as one of the products of that country, and to inquire whether you are ready to undertake the duty of arranging with the authorities at the Royal Botanical Gardens at Kew and at Edinburgh in regard to such of the plants at those places as may be fit to be moved at the time that your stay in this country is completed, and of conveying them to the Botanical Gardens at Calcutta.

This duty had been entrusted to the late Dr. Anderson, Superintendent of the Botanical Gardens at Calcutta, but the lamented death of that officer obliges His Grace to make other arrangements.

The number of plants at Kew is not believed to be large; but Dr. Anderson had, with the help of Dr. Christison, of Edinburgh, the authorities of the Botanical Gardens, and Messrs. Lawson, succeeded in collecting a considerable number of plants (now over 600) in different stages of growth. Some of these will be fit for removal at the beginning of next year.

Dr. Christison is in communication with the Secretary of State in regard to them; and, should it appear that a sufficient number of plants could properly be removed by the time of your departure for India, the Secretary of State in Council will grant you the sum of £50 in consideration of the trouble and expense which you will have in visiting Edinburgh and safely conveying the plants from that place to Calcutta.

By the enclosed letter from the late Dr. Anderson you will observe that, should it be expedient to remove any of the plants which are not yet fit for so long a voyage as that to Calcutta, Dr. Hooker is kindly willing to receive them at Kew, whence there will probably be more opportunities of getting them safely transported to Calcutta; but this is a matter which, with the other details, should you accept the commission, you will arrange in communication with the Revenue Department of this Office, with which you are instructed to place yourself in communication.

I transmit also a printed copy of the report made by Dr. Christison.

From H. MERIVALE, Esq., C. B., Under Secretary of State for India, to DR. CHRISTISON,—dated India Office, London, the 10th November 1870.

I AM directed by His Grace the Secretary of State for India in Council to acknowledge the receipt of your letter of the 25th ultimo, in which you inform him of the serious illness of Dr. Thomas Anderson, Superintendent of the Botanical Gardens at Calcutta, and entrusted in this country with the duty of collecting and despatching to Calcutta plants of ipecacuanha in order to establish that valuable medicine as one of the products of India. At the request of that officer you also report on the number and condition of the plants now in the Royal Botanical Gardens at Edinburgh and at Messrs. Lawson's nursery.

Since the receipt of your letter His Grace has learned with very great regret that Dr. Anderson's illness had resulted in his death. Apart from the other merits and qualifications of this able and zealous officer, his loss will be very much felt in regard to this experiment, in which he had taken such a deep interest. But, sensible as the Duke of Argyll is of the difficulty of supplying Dr. Anderson's place in this matter, he hopes that the progress which, with your aid and that of the authorities of the Botanical Gardens at Edinburgh and Kew, and of Messrs. Lawson, he had been enabled to make in obtaining plants has been so great that the chief difficulty is now in the safe conveyance of such as may be ready to Calcutta, and he hopes shortly to make a satisfactory arrangement for that purpose. When that is completed, you will be again addressed from this Department.

I am further to express to you the thanks of the Secretary of State in Council, not only for the interesting report which you have made upon these plants, but also for such of them—and those on account of their undoubted genuineness the most valuable—as you took the trouble to procure from Dr. Gunning, of Rio Janeiro.

I am also to ask you to convey His Grace's thanks to Mr. Macnab and Messrs. Lawson for the services which they have rendered in taking care of and increasing the number of plants.

A copy of your report will be transmitted to the Government of India.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 75, dated India Office, London, the 22nd December 1870.

IN continuation of my despatch No. 69, dated the 16th ultimo, I forward to you herewith a copy of further letters which have been received from Dr. Christison, and of the reply which I have caused to be addressed to him. I also forward a copy of a letter from Dr. Farquhar begging to decline the charge of conveying the plants to India.

2. The letter to Dr. Christison will explain my decision upon the points submitted to me.

3. With respect to the terms on which Messrs. Lawson have given trouble and attention to the cultivation of the plants with them, the Inspector General of Forests should be directed to send to them a "good allowance" of fresh deodar seed according to their request.

From R. CHRISTISON, Esq., to Her Majesty's Under Secretary of State for India,—dated Edinburgh, 40, Moray Place, the 26th November 1870.

SINCE receiving your letter and queries respecting the ipecacuan plants under cultivation in the Royal Botanic Garden and in Messrs. Lawson's nursery, I have several times considered with Mr. Macnab the question of the transport of the plants to India; and two days ago I had also the advantage of the opinion of Dr. Farquhar, of the India Medical Service, who had much to do with suggesting to the Government at Calcutta the introduction of the ipecacuan culture.

The result is that both Dr. Farquhar and I concur with the opinion of Mr. Macnab, that it would be hazardous to remove the plants in the winter season; that the most advisable course is to wait till the beginning of June, so as to secure them against exposure to cold in this country; and that they will thus arrive at the most favorable season for transport up-country in India, *viz.*, when the dry heats are over, and the wet season begins. The reason for this preference is, that not only Marcgrav and Riso, who first described the ipecacuan plant in 1648, but likewise every successive Brazilian traveller who has noticed the subject, represents the plant to grow in a damp atmosphere under the shade of woods and exposed to full tropical heat. It is also, under conditions equivalent to these that their cultivation has proved eminently successful equally in the Botanic Garden and in Messrs. Lawson's hands.

If the botanical and horticultural advisers of the Council for India adopt Mr. Macnab's suggestions, it is time enough to settle what precautions should be taken for securing the transmission of the plants to their ultimate destination when the period of their departure approaches. It is evident from Mr. Macnab's experience of the transmission of plants by sea, and that of Dr. Farquhar as to the transport up-country in India, that, although they prove very hardy in our stoves, and even stood the voyage hither from Brazil well, various precautions will be necessary both on the voyage to Calcutta and on the journey into the interior by the Indian railways.

I beg to add that Mr. Macnab sees no reason whatever why such plants as were received last July from Rio Janeiro should not be shipped thence direct to Calcutta. He even thinks they might very well be at once forwarded hence for multiplication in India, should any further consignment arrive here from Dr. Gunning. I will gladly learn what the opinion of the advisers of the Council is on that question, and will write in conformity with it to Dr. Gunning. I have been expecting for some time a further arrival of plants from him, and ought to write to him soon that no others have come since his first consignment four months ago.

I have had a conversation with Mr. Charles Lawson, junior, of the Messrs. Lawsons' firm, about the footing on which they have been cultivating their plants for Government; and he informs me that his firm understand they are doing so on the usual footing of exchanges, and that they will be very glad to receive, in exchange for their plants, "a good allowance" of deodar seeds.

From R. CHRISTISON, Esq., to C. B. PHILLIMORE, Esq.,—dated Edinburgh, the 15th December 1870.

ANOTHER consignment of ipecacuan plants from Dr. Gunning, of Rio Janeiro, arrived at the Botanic Garden here yesterday afternoon, and I have examined them this morning with Dr. Balfour and Mr. Macnab.

A box with mould contained a few plants in good condition for multiplication by cutting. Had they been numerous enough, Mr. Macnab would have proposed to send the box off to India at once. But unfortunately the plants are too few in number, and Mr. Macnab is persuaded, from various circumstances, that the box must have been tampered with, and that it had contained many more. He proposes, therefore, to retain these plants for multiplication here.

There came also, at the same time, a large paper parcel of roots and stems, probably a hundred plants altogether. Had they been put simply into the box with the mould, they would have arrived fit for multiplication; but packed as they were, they have dried up merely into good pharmaceutical specimens without vitality.

No letter has come in explanation, but I shall write by the first post to Dr. Gunning and tell him the result of his second attempt to supply us.

The nursery of growing young plants continues to thrive excellently.

From H. MERIVALE, Esq., Under Secretary of State for India, to R. CHRISTISON, Esq.,—dated India Office, London, the 20th December 1870.

I AM directed by His Grace the Secretary of State for India in Council to acknowledge the receipt of your letter of the 26th ultimo, on the subject of the ipecacuan plants now under cultivation at Edinburgh in the Royal Botanic Garden and the Nursery of Messrs. Lawson, and reporting the result of a consultation which you had held with Mr. Macnab and Dr. Farquhar as to the best time of removing the plants to India. An additional intimation, dated the 15th instant, of the arrival of a further supply from Dr. Gunning has also been received at this Office from you.

In reply, I am to inform you that, under the representations made by you, His Grace is quite satisfied that the plants should not be removed from Edinburgh until the end of March or beginning of April so as to reach Calcutta in June—the time decided upon at your consultation with the above-named gentlemen. You will have learned from Dr. Farquhar that he has been forced to decline the charge of conveying the plants to India, and, therefore, some other arrangement will be necessary. Should there be no person returning to India to whom the charge of the plants could be safely consigned, it seems to the Duke of Argyll that they might, if properly packed in cases, be despatched in safety from Glasgow or Liverpool through the Suez Canal to Bombay, and thence sent overland to Calcutta. The Secretary of State quite agrees that any further consignments from Rio might now be sent off direct to India as your letter proposes, and he regrets to learn that the last box has been so tampered with that that course cannot be taken with it.

With respect to your account of the footing on which Messrs. Lawson are cultivating the plants they possess for the Government, it accords entirely with what the department had understood to be the arrangement with Dr. Anderson, and the Government of India will be directed to transmit to Messrs. Lawson such a quantity of deodar seeds as they request.

I am not to conclude without again asking you to accept the the hearty thanks of the Secretary of State in Council for the kind and disinterested manner in which your love of science has led you to render your assistance to the department in this matter. I am also to ask you to convey to Dr. Balfour and to Mr. Macnab the acknowledgments of the Secretary of State for the successful attention which they have so zealously given to the introduction of this important plant into India.

From SURGEON-MAJOR T. FARQUHAR, M. D., to Her Majesty's Under Secretary of State for India,—dated 16, Rubislaw Terrace, Aberdeen, the 30th November 1870.

IN reply to your letter of the 10th November, referring to ipecacuan plants for India, I beg first to acknowledge with thanks the proposal that I should be deputed to convey them to Calcutta.

I beg, however, that I may be allowed to decline the duty, for which a suitable man may, I trust, be very readily found.

Since seeing you on the subject in London I have visited Edinburgh, where I had the pleasure (along with Dr. Christison and Dr. Macnab) of seeing the plants in the Horticultural Gardens, and of going over the questions as to the season and plans most suitable for their removal to India.

Several facts in regard to the plants struck me as interesting.

First.—They are in a most satisfactory and, indeed, flourishing state in the Edinburgh Gardens under Mr. Macnab's care.

Second.—This opinion should be accepted as final that they should not be removed till spring, but allowed to remain in Edinburgh that they may go through a system of hardening.

Third.—Mr. Macnab clearly demonstrates the most acceptable fact that the ipecacuan plant can be readily multiplied by cutting up the fresh roots into small pieces, which readily bud.

It therefore appears that, instead of considerable expense being incurred in securing plants, and transmitting them in expensive cases across the sea, many hundreds of them can be raised from a few pounds of fresh roots.

The Edinburgh plants that will be ready for shipment in spring should, however, still be sent, for, on being forwarded to different parts of India, it will at once be seen in what localities, and under what conditions, root plants are most likely to thrive.

It would be likewise of the first importance that some of the natives of India should be interested in the subject of the cultivation of the plant, so that it may become, at as early a date as possible, a commercial commodity, and find its way into every bazaar in the country.

P. S.—On reading over Dr. Christison's letter as to the season of the year at which the plants should be sent to India, I beg to say that, in talking over the matter in Edinburgh, I meant him to understand that the beginning of June would be the best month in which the plants should arrive in India.

This would lead to their being despatched from this country in the end of March, which would give them a more favourable season for their passage through the Red Sea.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 21-23 (Agriculture and Horticulture), dated Simla, the 29th June 1871.

Read again—

Secretary of State's despatch No. 75 (Public), dated the 22nd December 1870, regarding the transmission of a number of ipecacuanha plants to India.

Circular from the Home Department, to the Local Governments and Administrations, forwarding copy of the above despatch, No. 577—86, dated 31st January 1871.

Read also—

Letter from the Home Department, in continuation of the above circular, to the Governments of Madras and Bombay, Nos. 2014 and 2015, dated 24th April 1871.

From the Government of Bengal, No. 647, dated the 3rd March 1871.

From the Government of the North-Western Provinces, No. 369 A, dated the 24th March 1871.

From the Government of Bombay, No. 1412, dated the 31st May 1871.

From the Government of Fort St. George, dated the 7th June 1871.

OBSERVATIONS.—In the despatch above-cited the Secretary of State informed the Government of India that he had decided to send out the ipecacuanha plants which had been collected at Edinburgh, so as to reach Calcutta in June, or that, failing a proper person to take charge of them to Calcutta, they would be sent to Bombay *via* the Suez Canal.

2. In anticipation of the arrival of the plants, the Governments of Bengal and the North-Western Provinces were asked to submit reports from the Superintendents of the Botanical Gardens at Calcutta and Saharunpore as to the localities best suited to the plant, and the Governments of Madras and Bombay were afterwards asked to state if it could be cultivated on the Nilgiris and the Mahabaleshwar Hills, respectively.

3. Mr. Clarke, Acting Superintendent of the Calcutta Botanical Gardens, proposed as a fit place the Bhanum Pookree spur close to the main road between Silligori and Pankabari and in the Sikkim terai. Dr. Jameson, Superintendent of the Saharunpore Botanical Gardens, thinks that nowhere in the North-Western Provinces would the plant succeed.

4. The Government of Bombay forwards a report from the Superintendent of the Botanical Gardens, suggesting that the cultivation should be attempted at Mahabaleshwar under the superintendence of the Assistant in charge of the Cinchona Plantation at Lingmulla. He also recommends the introduction of rhizomes direct from Brazil, so timed as to reach Bombay in June. The Government of Bombay asks whether, if the plants arrive *via* Bombay, any portion of the consignment can be stopped for trial at Mahabaleshwar.

5. The Government of Madras forwards a brief note from Mr. McIvor, stating that he considers the high plateau of the Nilgiris too cold for the successful cultivation of the plant. But he is of opinion that in well selected places, and at elevations not exceeding 4,000 feet, the plant may be successfully grown in those hills.

6. It is not exactly known how many plants may be expected, nor has any intimation yet been received of their despatch. It is advisable, however, with a view to their probable early arrival that the places for the experimental cultivation should at once be decided. And it seems to the Governor General in Council that the Sikkim terai, the lower slopes of the Nilgiris, and Mahabaleshwar, present a fair prospect of success. Accordingly, on the arrival of

the plants, they should be distributed in three equal portions between these places. The Governments of Bengal and of Bombay will, therefore, be requested to effect in this sense an equal distribution according as the plants arrive at Calcutta or Bombay.

ORDER.—Ordered, that a copy of these remarks be forwarded to the Governments of Madras, Bombay, and Bengal, for information and guidance.

From Her Majesty's Secretary of State for India, to the Government of India,—No. 18, dated India Office, London, the 31st May 1871.

IN continuation of my despatch of the 22nd of December last, No. 75, on the collection of ipecacuanha plants for transmission to Calcutta, I have to inform your Excellency in Council that I have determined to avail myself of the return to Bombay of Mr. W. Walton, of the Cotton Department of that Presidency, to forward a small Wardian case containing from 25 to 30 ipecacuanha plants, which have been got ready for the voyage out of the stock now at the Royal Botanical Gardens at Edinburgh.

2. Mr. Walton, who leaves Southampton for Bombay on the 17th of June, and is willing to take charge of this case, is accustomed to the charge of similar plants. Should he succeed, as he hopes to do, in conveying the plants safely, they will arrive in India at a favorable time. They will be transmitted from Bombay by Railway to the Superintendent of the Botanical Gardens at Calcutta, and special injunctions should be given to the Railway functionaries to be careful of the case during its transit.

3. I shall address His Excellency the Governor of Bombay on this point.

4. The risk of the destruction of the plants through the heat of the passage down the Red Sea from June to the end of September is so great that I have informed Dr. Balfour that I do not purpose sending any further quantity of these plants until October next.

From J. GEOGHEGAN, Esq., Under Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce, to the Secretary to the Government of Bombay,—No. 50, dated Simla, the 8th July 1871.

IN continuation of the Resolution in this Department, No. 22, dated 29th ultimo, and with reference to the despatch from the Secretary of State, to the Government of Bombay, No. 42, dated 31st May last, I am directed to request that on its receipt the Wardian case containing the ipecacuanha plants sent out from England may be sent on as soon as possible to the Superintendent of the Botanical Gardens at Calcutta without removing any of the plants. As only 25 or 30 plants have been sent, and are arriving later than was intended, the Governor General in Council is of opinion that they should be planted out in the Sikkim Terai, which seems to be the most favorable locality for them.

From GEORGE KING, Esq., M. B., Superintendent, Botanical Garden, Calcutta, to the Officiating Under Secretary to the Government of Bengal,—No. 420, dated Botanical Garden, the 21st July 1871.

WITH reference to the endorsements marginally noted, I have the honor to report, for the information of His Honor the Lieutenant-Governor, that a Wardian case containing twelve plants of ipecacuanha has been received at this garden. The case was brought to Bombay under the care of Mr. W. Walton, and from thence forwarded to Calcutta by railway.

The condition of the plants is highly satisfactory, and is most creditable to Mr. Walton. They all present a healthy appearance, and have apparently suffered but little in transit from England.

I propose to keep them here for a short time, so that they may get well established, and then to forward them to Sikkim under the care of a competent person.

No. 2205, dated Fort William, the 27th July 1871.

Endorsed by the Government of Bengal.

COPY forwarded to the Under Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, with reference to his letters Nos. 23 and 51, dated, respectively, 29th ultimo and 8th instant.

From J. GEOGHEGAN, Esq., Under Secretary to the Government of India in the Department of Agriculture, Revenue, and Commerce, to the Secretary to the Government of Bombay,—No. 102, dated Simla, the 18th August 1871.

IN continuation of this Office letter No. 50, dated 8th ultimo, I am directed to forward copy of a communication from the Government of Bengal, No. 2205, dated 27th idem, reporting that a Wardian case containing twelve ipecacuanha plants sent out from England under the care of Mr. Walton, has been safely received at the Botanical Gardens, Calcutta, and to request that the thanks of the Government of India may be conveyed to Mr. Walton for the care he bestowed upon the plants during their transit.

Statement of Rain-fall and Agricultural Prospects in Bengal, Bombay, Punjab, Central Provinces, Oudh, Mysore, Coorg, Central India, Sindh, and Berar.

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending	Inches.			
1	BENGAL	Bhaugulpore	August 4		August 5	2.6	August 7	Janerah gone; Rice very good.	* Will be furnished hereafter by the Collector.
		Monghyr	July 5	.....	"	2.1	"	Bhadoi much injured; Amun excellent.	
		Purneah	July 28	.....	"	4	"	"	
		Rajnehal	August 5	.....	"	2	"	Bhadoi on the Deorahs nearly de- stroyed; Amun good.	
		Deoghur	"	.....	"	5.8	"	Favorable. Heavy rain destroying Sugar-cane and Janerah.	
		Nya-Doomka	"	.....	"	2.7	"	Rice very promising; Indian-corn damaged by rains.	
		Pakour	"	.....	"	3.4	"	Same as last week.	
		Patna	" 16	2.56	"	.....	" 17	Rice crop doing well; Bhadoi crop much injured by late rains and floods.	
		Gya	July 29	.....	"	2.6	" 7	Favorable. Bhadoi doubtful.	
		Chumparun	"	.....	"	5	"	Bhadoi crops in excellent condition.	
		Shahabad	August 5	.....	"	1.2	"	Rice favorable; Janerah and Murwah injured.	
		Tirhoot	July 29	.....	"	1.8	"	Loss of about six annas of Bhadoi crops throughout the District owing to floods and rain; Dhan may not suffer much.	
		Ditto	August 5	.....	"	1.8	"	Generally very satisfactory.	
		Rajshahye	July 29	.....	"	2.2	"	Our generally damaged; Amun, though slightly injured, is in good condition.	
		Bograh	" 28	.....	"	5.6	"	Good.	
		Dinagapore	" 29	.....	"	4.4	"	Favorable.	
		Maldah	" 28	.....	"	2.9	"	Good, except in Thannah Kaliachak, where two annas Bhadoi crop injured by the rise of the river.	

No.	PRESIDENCY OR PROVINCE	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending.	Inches.			
		Moorshedabad	July 29	...	August 5	1.8	August 7	Good, but danger apprehended from inundation. Some injury done by it.	
		Pubna	"	...	"	3.2	"	Six annas Ous damaged by the rise of rivers; Amun still very promising.	
		Ditto	August 5	...	"	10.8	"	Ditto ditto.	
		Burdwan	"	Sufficient	"	...	17	Prospects good. Partial damage by overflow of Damuda and Bhagurthee.	
		Bancoorah	"	...	"	3.7	"	An unprecedentedly rich harvest of rice is expected if it rains in September.	
		Beerbhoom	"	...	"	4.9	"	Good.	
		Hooghly	July 28	...	"	5.6	"	All crops thriving.	
		Ditto	August 5	...	"	3.7	"	Favorable, except on low lands.	
		Howrah	"	...	"	3.6	"	Favorable.	
		Midnapore	"	...	"	4.2	"	Good.	
		Nuddea	"	...	"	1.4	"	Twelve annas Ous expected; Amun promising.	
		Jessore	July 28	...	"	2	"	Good throughout; Ous and Indigo suffered severely in Magoorah.	
		Ditto	August 4	...	"	3.8	"	Ous being reaped; rest good.	
		Dacca	August 15	1.10	"	...	17	Good.	
		Backergunge	July 29	...	"	2.3	7	Favorable.	
		Furzedpore	"	...	"	3	"	Good.	
		Ditto	August 5	...	"	2.6	"	Good.	
		Mymensingh	July 29	...	"	6.7	"	Ous very fine; Amun partly sacrificed to Jute.	
		Cachar	"	...	"	4.6	"	Ous worse; Amun good; a little more sun required for Tea.	
		Noacolly or Bullooh	"	...	"	3.7	"	*	* Not received, but will be submitted regularly from next week.
		Tipperah	August 29	...	"	3.1	"	Good and favorable.	
		Cuttack	August 16	4.82	"	...	17	Very favorable.	
		Pooree	July 29	...	"	2.5	7	Very fair.	

BENGAL, concluded ...

Place	Month	Day	Temp.	Wind	Clouds	Remarks
Hazareebaugh	August	5	3-7	"	"	Favorable.
Lohandugga	July	29	3-4	"	"	Very good and promising.
Mambhoom	August	5	7-8	"	"	Favorable.
Singbhoon	July	29	2-9	"	"	Favorable.
Durrung	"	"	2-5	"	"	Fair.
Nowgong	"	"	7	"	"	Our promising.
Kamroop	"	28	0	"	"	Favorable.
Julpigoree	"	"	2-2	"	"	Fair.
Gowalparah	"	29	5	"	"	Our respected; Salee or Amun being transplanted.
Garohills	"	28	2-9	"	"	Healthy.
Darjeeling	"	"	3-6	"	"	Hill crops thriving; others much injured by the hail-stones.
Cooch Behar	"	"	"	"	"	Good
Lucknow	July	28	4-7	"	"	"
"	August	11	"	"	"	In parts Rice and Kodo suffered from excess of rain, and sowing delayed. State of kharif crops not satisfactory. Kharif prospects good.
"	"	16	"	"	"	"
"	"	"	"	"	"	"
Onao	July	28	4-7	"	"	Good.
Barabunkee	"	"	6-3	"	"	Kodo, Sugar-cane, and Juar crops are suffering from excess of rain.
Seetapore	"	"	4-9	"	"	Favorable
Hurdni	"	"	4-8	"	"	Cultivation kept back by excessive rain
Kherse	"	"	3-9	"	"	Sugar-cane crops suffering from the excess of rain.
Fyzabad	"	"	4-9	"	"	Rice crops good; Juar and Kodo suffered much from excess of rain.
"	August	11	"	"	"	"
"	"	16	"	"	"	Sugar-cane good; Jarhan being transacted; Wheat lands ploughed.
Baraich	July	28	2-7	"	"	Kharif crops have almost everywhere germinated.
Gonda	"	"	4-2	"	"	"
Rai Bareilly	"	"	3-3	"	"	Aghani very much behind-hand: Paddy favorable.
Sultanpore	"	"	4-2	"	"	Much rain, but no serious injury done yet, excepting along the River Goomti.
Pertabgurh	"	"	3-7	"	"	Crops are thriving well, fields are being prepared for showing Barja and Mothi.

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.		
					Week ending.	Inches.					
3	MYSORE ...	.....	.....	...	July 29 ...	'45	August 7 ...	Generally good, but the want of sea- sonable rain is everywhere felt, and affects the young crops on the high lands injuriously.	Deficient rain till with- in past three days.		
	" ...	.....	August 15 ...	2.5	.....	...	" 16 ...	Improved	...		
4	COORG ...	.....	.....	...	July 29 ...	8.42	" 7 ...	Very good.	* Not reported.		
	" ...	.....	.....	*	.....	...	" 16 ...	Crops in good condition ...	...		
5	CENTRAL INDIA AGENCY.	Indore	.....	...	July 22 ...	1.9	" 1 ...	Favorable.	Previous rain-fall 17 inches.		
		Bhopal—Sehore	.....	...	" "	9.7	" "	Good	...		
		Gwalior		...	...	" "	6.	" "	Favorable.	...	
		Bundelcund—Nowgong		...	...	" "	5.6	" "	Ditto	Previous rain-fall 15 inches.	
		Western Malwa.	Augur		...	" "	2.4	" "	Good	Previous rain-fall 1.5 inches.	
						Mehidpore		...	" "	4.37	" "	"	Previous rain-fall 3.16 inches.
		Rutlam		...	...	" "	3.96	" "	"	Previous rain-fall 3.09 inches.	
						Maunpore		...	" "	1.07	" "
		Deputy Bheel Agency.	Bagode		...	...	" "	2.06	" "	"	...
							Burwance		...	" "	.06
		Jammia		...	...	...	" "	.04	" "	"	...
							Khull		...	" "	.09
		Bheel Agency.	Sirdarpore		...	...	" "	1.79	" "	Fair	Previous rain-fall 10.07 inches.
14th to 18th July 1871							...	" "	...	...	...

	Thurr and Parkur	.....	August 15 ...	0-49†	.....	...	+	.....	Unfavorable for want of rain	...
SINDH	Hyaerabad	...	August 15 ...	0-49†	.....	...	...	August 17 ...	Prospects good, but rain wanted in high-lying Districts.	... * From 1st to 15th July 1871. † The fall of rain in May last encouraged the people to cultivate small patches of ground in anticipation of a favorable season. Since then no rain has fallen. The people are disappointed, and the young plants, for want of water, are perishing. Famine expected. ‡ Total fall during the year 3-20. Inundation of the Indus 16 feet 9 inches. Inundation favorable to agricultural prospects.
BELAR	{ Omrawottee Akola }	... ...	..... .....	14 ..	..... .....	...	...	August 16 .. "	Cotton and Grain prospects good.	Rain is much wanted; unless there are a few heavy showers soon, there will be a considerable falling off in the output of the autumn crops. Weather continues cloudy, and rain seems imminent. Public health good; cattle disease prevalent in some parts.
CENTRAL PROVINCES	Nagpur	...	August 12 ...	2-6	.....	...	...	"	Jawari sowings slightly delayed. Transplanting rice nearly finished. Prospects generally good. Cotton in Wurdha favorable.	
	Jabalpur	...	" 5	10-5	.....	...	...	"	Prospects excellent. Heavy rain, but crops uninjured.	
	Hoshangabad	...	" "	7-3	.....	...	...	"	Generally favorable. Cotton slightly injured in Narsingpur.	
	Raipur	...	"	3-6	.....	...	...	"	Kharif crops generally good, with little damage from continual rain.	

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending.	Inches.			
9	PUNJAB	Umballa	Fortnight ending August 16	7.9	.....	...	August 17	Crops good	The Lieutenant-Governor remarks on 17th August— Rain generally wanted in Districts west of the Sutlej. East of the Sutlej and in the Jullundhur Doab, the agriculture prospects are decidedly good. * In the city during the fortnight previous.
		Jullundhur	"	1.2	.....	...	.....	Crops generally flourishing.	
		Lehore	"	Nil.	.....	...	.....	Crops on unirrigated lands want rain. Baree Doab Canal water too has been stopped.	
		Mooltan	"	3.5	.....	...	.....	Crops on unirrigated lands want rain. Crops flourishing.	
		Rawul Pindee	"	17.6*	.....	...	.....	Prospects good	
10	BOMBAY	Ahmedabad	15	1.39	.....	...	August 17	Crops throughout most of the District withering, and sowing operations retarded from want of rain.	
		Dharwar	"	16	.....	...	"	Very heavy floods from 3rd to 8th. Prospects of an abundant harvest.	
		Kaira	"	15	.....	...	.....	Prospects bad.	
		Khandeish	"	2.68	.....	...	.....	Crops generally good. Prices risen slightly.	
		Poona—4 Western Districts	"	5.37	.....	...	.....	Rain very scanty. Sowing at a standstill. The few growing crops not promising. Grain dear. Prices rising.	
		—4 Eastern Districts	"	0.22	.....	...	.....		

GOVERNMENT OF INDIA.
LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., cap. 67.

The Council met at Simla on Tuesday, the 15th August 1871.

P R E S E N T :

His Excellency the Viceroy and Governor General of India, K. P.,
G. M. S. I., *presiding*.

The Hon'ble John Strachey.

The Hon'ble Sir Richard Temple, K. C. S. I.

The Hon'ble J. Fitzjames Stephen, Q. C.

The Hon'ble B. H. Ellis.

Major-General the Hon'ble H. W. Norman, C. B.

The Hon'ble F. R. Cockerell.

The Hon'ble R. E. Egerton.

His Highness Sarāmade Rājāhāc Hindústān Rāj Rājendra Srī Mahārājā
Dhirāj Sivāi Rām Sing Bahādur, of Jaypūr, G. C. S. I.

His Highness the Mahārājā of Jaypūr made a solemn declaration of allegiance to Her Majesty, and that he would faithfully fulfil the duties of his office.

INDIAN TARIFF ACT (AMENDMENT) BILL.

The Hon'ble SIR RICHARD TEMPLE, in moving for leave to introduce a Bill to amend the Schedule of the Indian Tariff Act, 1871, said that the necessity for legislation had arisen in the following manner: The Indian Tariff Act, 1871, imposed an *ad valorem* duty of one per cent. on the export of indigo. Their French neighbours at Pondicherry had evaded this tax by exporting indigo leaf (on which no duty at present was levied) to Pondicherry, where, on reaching the factories, it was manufactured into indigo; and since the French Government levied no duty on exported indigo, the French manufacturer obtained a slight advantage over those who exported from British territory. This state of things naturally gave rise to complaints, and the present Bill was intended to remedy an admitted hardship, by imposing a duty on indigo leaf, and thus placing the French and English manufacturer on a footing of equality.

The Motion was put and agreed to.

INDIAN WEIGHTS AND MEASURES OF CAPACITY BILL.

The Hon'ble MR. STEPHEN moved for leave to introduce a Bill to regulate the Weights and Measures of capacity of British India. He said that the Bill had been placed in his hands, not because he was in any way especially familiar with the subject, but under somewhat peculiar circumstances, of which it was right that he should inform the Council. His Excellency the President having signified to the Council the disallowance of the Weights and Measures Act passed last year, it was right that the grounds of that disallowance should be publicly known, and that it should be understood that there was not any difference of opinion as regarded matters of principle between the Secretary of State and those with whom this measure had originated. All parties were

agreed as to the great desirability of establishing an uniform standard of weights, and it was unnecessary to repeat the instances brought forward by Colonel Strachey last year to show the confusion and inconvenience to which the existing diversity of standards in various parts of the country at present gave rise. The Act, however, had gone somewhat beyond the original scheme in dealing with measures of length, and the Secretary of State had, in the exercise of that abundant caution which such a matter demanded, shrunk from sanctioning a measure which might seem in any manner to interfere with the existing customs and tastes of the people. If any such result was likely to ensue, the Government of India entirely concurred that it was too high a price to pay for any conveniences and advantages which the Act might have secured. The difference between the Government of India and the Secretary of State was, accordingly, one of degree rather than of principle; and, since it had been resolved to postpone the passing of the measure in its entirety, the course proposed was to re-enact those parts of the Act as to which no difference of opinion existed. This would precisely carry out the views of the Secretary of State, those provisions which he considered undesirable being omitted. This was the object of the present Bill. It was believed that the introduction of a recognized standard of weights and measures would offend no existing custom, and would gradually make its way among the people as the advantages of uniformity on such a subject came to be generally appreciated. The Railway and other great Companies had already adopted an uniform standard, and, he believed, that, in no long time, the people at large would spontaneously follow their example. On these grounds he hoped that leave would be given.

His Excellency THE PRESIDENT said—"As the Indian Weights and Measures Act of 1870 has been disallowed by Her Majesty, and will, from the date of this my signification of that disallowance, cease to have any legal validity, I wish to say a few words as to the position of the Government of India with reference to it, and to the measure by which it is contemplated to replace it. It never was the intention of the Government to force any measure on the public against the wishes and tastes of the community at large. Those who proposed the original measure did not intend that such of its provisions as were other than permissive should come into operation till it appeared that the public mind was ready to accept them. I am well aware that the forcible introduction of a measure of this sort, before the public was alive to its advantages, might be calculated only to defeat the hopes and intentions of those who advocate it. The Government of India has never had any intention of attempting any such forcible introduction. I trust, however, that the present disallowance of the measure will not have the effect of indefinitely postponing what I believe to be a most useful reform; but that the Bill, for the introduction of which leave is now asked, will practically lay the foundations of a system of uniform weights and measures throughout the empire. The Railway Companies have shown that they are anxious to second the Government in the attempt to introduce the new system, and I hope that the present Bill will be found to arm Companies, Municipalities and other bodies with adequate powers to facilitate the gradual and permissive adoption of a system which I believe to be likely, at no distant time, to conduce to the public convenience."

The Motion was put and agreed to.

CRIMINAL TRIBES BILL.

The Hon'ble MR. STEPHEN also presented the Report of the Select Committee on the Bill for the Registration of Criminal Tribes and Eunuchs.

The Council adjourned to Tuesday, the 29th August 1871.

H. S. CUNNINGHAM,

SIMLA;
The 15th August 1871. }

Offg. Secy. to the Council of the Governor
General for making Laws and Regulations.

No. 32

of 1871.



SUPPLEMENT TO
The Gazette of India.

SIMLA, SATURDAY, AUGUST 26, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT to the GAZETTE OF INDIA will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA is required by Law, of which it has been customary to publish in the CALCUTTA GAZETTE, will be included in the SUPPLEMENT. For such Orders and Notifications the body of the GAZETTE must be looked to.

GOVERNMENT OF INDIA.
FOREIGN DEPARTMENT.

Discovery of a Coal Mine in the Territories of His Highness the Nizam.

From C. B. SAUNDEES, Esq., C. B., Resident at Hyderabad, to the Secretary to the Government of India, Foreign Department, with Governor General,—No. 8, dated Hyderabad Residency, the 3rd July 1871.

I HAVE the honor to forward, for the information of His Excellency the Viceroy and Governor General of India, the accompanying translations of correspondence* with His Highness the Nizam's Minister regarding the discovery recently of a coal mine in His Highness's territory.

* No. 1510, dated 8th May 1871, with enclosures, from His Highness the Nizam's Minister.

No. 1727, dated 25th May 1871, with enclosures, from ditto ditto.

No. 1254, dated 26th May 1871, from the Resident, to Minister.

No. 1828, dated 2nd June 1871, from the Minister, to Resident.

2. The subject was first brought to my notice by the Officiating Collector, Kistna District, under orders of the Madras Government, on information received by that officer from an inhabitant of His Highness's territory, with samples of coal from a locality, which was roughly indicated as lying in the Oraganti Sircar, about 224 miles from Juggiapet and 96 miles from Budrachellum, forming a waste of 32 miles in circumference. The Collector also forwarded to me one of the specimens referred to, which was undoubtedly genuine coal, and stated that his informant asked for a reward of Rs. 2,000 to show the place where the specimen was found, and where it was said to lie near the surface in great quantities; the present specimen having been obtained about three feet from the surface.

3. I immediately brought the matter to the notice of His Highness the Nizam's Minister for his favourable consideration, with the remark that it would be for him to determine whether he would be prepared to offer the informant so large a sum as Rs. 2,000, which exceeded the reward offered by the British Government for similar information by Rs. 1,000,

without taking the precaution of depositing the reward with a third party, to be paid only in the event of the area occupied by the coal being sufficiently extensive and near the surface to enable its being worked with advantage.

4. From the Minister's reply, No. 1510 of the 8th May 1871, it appeared that he was fully alive to the importance of the discovery of coal in His Highness's dominions, enquiries having been already set on foot by him, and an officer of His Highness's Government specially detailed on this duty, and that the Tehseeldar of Talooka Kandeecondah in the Khammumet Sircar had already obtained information of the existence of a coal mine in his talooka, which he was about visiting personally and reporting upon fully. The Minister, however, liberally agreed to the large amount of reward asked by the informant of the Collector of the Kistna District, provided the coal mine he spoke of was an entirely distinct and separate one from that which the Tehseeldar above mentioned was going to visit and examine. The Collector was informed accordingly, and was requested to direct his informant to take steps for pointing out the coal mine spoken of by him.

5. In the meantime, the Tehseeldar of Kandeecondah having visited the coal mine of which he had received information from other sources, submitted a detailed and interesting report, accompanied with several specimens of coal from it. This report is attached to the Minister's note No. 1727, dated 25th May 1871, and will be found among the translations accompanying this letter. It describes the coal mine as situated in the rocky bed of the forest stream called Goondralawag, which, flowing from the border of Dewurlah towards Goondral, in the Talooncha Estate, falls into the Godavery River. The coal is reported to crop out and lie very near the surface and on the bank of the river in large masses or heaps, where the Tehseeldar had caused the bed of the river to be dug, a stratum of coal was found so near as one yard below the surface occupying a space of 10 yards. He also traced a vein of coal extending along the bank of the stream to a distance of a quarter of a mile. The report gives further interesting details, and judging from those details and from the specimens of coal produced, there seems to be no doubt of the discovery of a real and extensive coal mine. With a view to its being worked and utilized hereafter, the Minister has given orders for the locality to be visited and examined by a competent and experienced person; but it is to be regretted that the coal viewer, Mr. Coulson, whose services he obtained about a year ago from England, died a short time since.

6. The Tehseeldar of Kandeecondah, Mahomed Ibraheem Ali Khan, it will be seen from the Ahkam or instructions issued by the Minister on this subject, is not only to receive the liberal reward of Rs. 2,000 from His Highness's Government, but also to obtain promotion to a higher grade in his department, in consideration of his zealous and successful exertions in the explorations for coal in His Highness's territory.

7. In conclusion, I may add that I shall keep the Government of India duly informed of any further action which His Highness's Government may take in connection with this interesting subject.

Translation of a letter from His Highness the Nizam's Minister, to the Resident at Hyderabad,—No. 1510, dated 8th May 1871.

I HAVE received your letter dated 28th April 1871, No. 1000, giving cover to copy of a communication from the Officiating Collector, Kistna District, and a Telooogo petition from Toomlooree Soobiah, inhabitant of Juggiapet, with a small packet containing a sample of mineral coal discovered in the District of Khammumet, His Highness's territory, forwarded for my information and favourable consideration, with your remark that it would be for me to determine whether I would be prepared to offer to the informant so large a sum as Rs. 2,000, or Rs. 1,000 more than was offered by the British Government for similar information in regard to the discovery, within British territory, of good workable coal without taking the precaution of insisting upon the reward being deposited with a third party, and only paid in the event of the area occupied by the coal being sufficiently extensive and near the surface to ensure its being worked to advantage. In reply, I beg to forward for your perusal a report from Mahomed Haneef, Talookdar of Khammumet, in answer to an Ahkam addressed to him on this very subject. It will be seen from the report referred to, that the Tehseeldar of that District, having obtained information of a coal mine, has already set out in search of it; moreover, I have issued orders through Mr. White, who is now engaged in the examination of coal in the direction of Cheenoor, for the immediate despatch of a person capable of prosecuting such enquiries to the Tehseeldar of Khammum, with a view to his first examining the coal mine which the Tehseeldar may succeed in discovering. If the locality prove to be the same that Kodavendi Venkyah gave notice of, he would not be entitled to any reward, since in point of time he would be forestalled by the Tehseeldar in actually pointing it out, and the latter would thus become entitled to promotion by way of reward. But should the locality discovered by Kodavendi Venkyah be a distinct one from

that which the Tehseeldar may succeed in discovering and pointing out, then after due examination if the mine prove to be of genuine coal and sufficiently extensive, a reward of Rs. 2,000 Halee will, of course, be granted to the informant above alluded to. It will not, however, in my opinion, be necessary to deposit the amount of reward with a third party, inasmuch as my agreement to the amount of reward solicited, and the assurance thereof given to the informant by the Collector of Kistna District on the authority of your communication to that officer, would form an arrangement not less reliable, perhaps, than the actual deposit of cash with a third party, since by the former procedure both Governments would stand pledged for but a trifling sum of money. Be so good as to request the Collector of Kistna District to require his informant to depute one or two persons on his part to the Talookdar of Khammum in order to point out the coal mine, if necessary.

Translated substance of a Report from MAHOMED HANEEF, Talookdar of Khammum, to His Highness the Nizam's Minister,—dated 28th April 1871.

WITH reference to the Minister's Akkam calling for information regarding the discovery of a coal mine either in His Highness's or British territory, to be ascertained from one Venkyah, inhabitant of Dantulpully, in Talook Khammum, who knows its locality, states that copies of the Akkam, with translation of Colonel Applegath's letter on the subject, have been forwarded to the several Tehseeldars of the District, calling on them to furnish the required information with all practicable despatch; that previously to this a report (copy enclosed) was received from the Tehseeldar of Kandecondah, dated 14th April 1871, giving notice of a coal mine, and of a block of coal obtained from it, and stating his intention to visit the spot in person to satisfy himself thoroughly and report positively on the subject; that the Tehseeldar was informed, in reply (copy enclosed), that his promised report is awaited with great interest, and should be submitted as early as practicable, and that his laudable exertions will be duly brought to the notice of Government. As regards the informant Venkyah, inhabitant of Dantulpully, it appears from the Tehseeldar's report, since received, that he has never been in Talook Kandecondah, but that two persons of British territory had been there in search of coal in His Highness's dominions, and that the Tehseeldar of Juggiapet had addressed the Tehseeldar of Kandecondah asking him to assist them. Upon this the latter officer having asked instructions whether the persons should be permitted to prosecute their purpose or not was told, under orders of the Sudder Talookdar, that they might be permitted to prosecute the search and take samples with them after weighment, being at the same time warned to bring Government orders for the future. Adds that nothing has been since heard as to who the two persons referred to were, where they proceeded, or whether or not they discovered any coal mines, and that should the Tehseeldar of Kandecondah succeed in his explorations for coal, no time will be lost in reporting the particulars to Government.

From MAHOMED IBRAHEEM ALI KHAN, Tehseeldar of Kandecondah, to the First Talookdar, Khammum District,—dated 14th April 1871.

I SOME time ago reported the arrival of some persons in search of coal from British territory, with a letter from the Deputy Sub-Magistrate of Juggiapet. Since that period I have heard that a person named Venkyah, inhabitant of Dantulpully, having obtained trace of a coal mine gave notice thereof to British Officers, applying for a large amount of reward; that a reward of one thousand rupees being offered, he declined to receive it, and has not since come forward. Upon this, deeming it inexpedient to remain inactive in the matter, I caused search to be instituted far and near for the coal mine referred to, and was so far successful as to obtain information of a coal mine in this talook* with a lump of coal therefrom. I have therefore started on a personal visit to the spot, after inspection of which, and having some portion of the ground dug up, I shall communicate the result in detail. In the event of my sanguine expectation of coming upon a coal mine being realized, I rely on your goodness for my exertions and the claims of informants for suitable rewards being duly brought to the favourable notice of higher authority. I am taking with me for comparison the sample coal brought to me. The circumstances above set forth may be reported to Government, should it be deemed expedient to do so.

* Kandecondah.

Official memorandum from the Talookdar of Khammum District, to the Tehseeldar of Kandecondah,—dated 27th April 1871.

IN reply to the forgoing, observes that the discovery of the coal mine is highly satisfactory, and it is hoped that several specimens of coal will be shortly forwarded for transmission to Government. The Tehseeldar is assured that after receipt of detailed information with samples of coal from him, his zealous exertions will be duly brought to notice. In the mean-

time his present report has been forwarded to put Government in possession of the limited information available. Adds that his further report is awaited with great interest, and should be furnished at as early a date as practicable.

Translation from His Highness the Nizam's Minister, to the Resident at Hyderabad,—No. 1727, dated 25th May 1871.

WITH reference to my letter dated 9th May 1871, No. 1076, regarding the Tehseeldar of Kandecondah being deserving of promotion for his having traced out the existence of a coal mine, and the promise of a reward of Rs. 2,000 to Kodavendi Venkyah, if the coal mine which he offered to point out should be a separate and distinct one from that discovered by the Tehseeldar above referred to, I have the pleasure to forward, for your information, a report, with enclosure, received from the Talookdar of Yelgundel District, relative to the coal mine last mentioned, with copy of an Ahkam issued by me on the subject.

From MAHOMED HANEEF, Talookdar of Yelgundel, to His Highness the Nizam's Minister,—No. 21, dated 17th May 1871.

In my previous report No. 12 of the 27th April 1871, I brought to notice the discovery of a coal mine by Mahomed Ibraheem Ali Khan, Tehseeldar of Talooka Kandecondah, informing the Tehseeldar at the same time that his further report, after a full inspection of the mine, accompanied with specimens of coal, would be awaited. The Tehseeldar, in reply, has now forwarded a memorandum (No. 60, dated 10th May 1871), together with three specimens of coal, each weighing 5½ seers, which, secured in a sealed box with the memorandum in original, I herewith submit. In doing so, I would beg to remark that the Tehseeldar has shown great zeal and energy, and taken much trouble in the exploration and discovery of the mine, even supposing any other person to have made the same discovery before the Tehseeldar, yet from the fact of such person having failed to point out the locality to any of His Highness's authorities, the Tehseeldar cannot, I submit, be considered as having no claim to the Government reward. I would further solicit consideration to his suggestion, which appears to be a judicious one, as to the employment of a certain number of men at two rupees each per mensem for the care of the mine, pending permanent arrangements and further orders from Government, and a sum of about Rs. 200, if sanctioned, would enable the jungle to be cleared and a passage prepared towards the locality, so that the person deputed by Government to examine the coal field might find his way to it without difficulty.

Memorandum from the Tehseeldar of Kandecondah, to the First Talookdar of Khammumet, No. 60.

WITH reference to the memorandum No. 76, dated 26th April 1871, on the subject of coal, and requiring me to submit a full report accompanied with additional specimens, to be laid before Government, and touching on other points connected with the same subject, I beg, in pursuance of the above instructions, to submit the following detailed account of what I have seen and discovered on a personal visit to the spot where the coal mine is situated, together with several specimens of coal selected from it, and hope that it will be found to contain full information on the subject.

2. It so happened that in order to visit the spot it was necessary for me to travel considerable distances (from 60 to 120 miles in all) beyond the limits of the talooka under my charge by difficult and dangerous routes, though it has now been ascertained from enquiries that up to Dewurlagoodem, in the direction of Goondral, under the Palooncha jurisdiction, there is a very clear road over the village of Kamaram, Talooka Pukhal, suitable for travellers as well as carts; but my men, who were employed on coal researches, ignorant of the road in question, led me by the same forest routes by which they had themselves come at first, and I was in consequence much distressed for food and water, and found my journey extremely difficult in other respects. At length, having travelled a distance of nearly 16 miles from the border of Dewurlagoodem towards the locality of the mine, past Kamaram and strictly over hills and through frightful forests, at 10 o'clock in the morning I arrived at the spot, and found that the mine lay towards the north-west point in the bed of the jungle stream called Goondralwag, which, flowing from the border of Dewurlagoodem towards Goondral, under the Palooncha jurisdiction, joins in Goodavery River.

3. The bed of the stream is not clear and open, being everywhere encumbered with large and irregular boulders. As rain had fallen two or three days previously, pools of water were observable in several places and foot-marks of elephants all round the place. The Koyawars, a wild tribe, informed me that the locality is daily frequented by wild elephants for the sake of

forage and water, and that it was not safe to stay there, for there was no certainty when and from what direction these wild animals might be approaching; but trusting in God, and relying on the support and auspices of Government, I continued my progress in search of coal, making my way through the irregular passage up and down the rocks before mentioned.

4. When I had proceeded a mile in the bed of the river I began to perceive traces of coal on its west bank, which I traced on to about quarter of a mile, when the vein terminated. I caused digging operation on a small scale to be carried out over and within the banks. Owing to the great heap of earth on the surface of the bank, and want of proper and efficient tools, it was found impossible to dig the bank down to its bottom; but the operation was successfully carried out within the bed of the stream to the depth of a yard, which brought to light, underneath the sandy surface, a stratum of coal occupying a space of 10 yards, where the bed was free from rocks; in some places coal is perceptible even above the sandy surface. A doubt suggested itself to my mind whether the stratum above referred to might not also extend below the large rock; but this point, I regret, could not be cleared up without a few days' stay on the spot, keeping away the elephants, making available a good supply of digging implements, and employment of professional men.

5. I should not omit to mention the large masses or heaps of coal that were seen lying in the bed of the river above the sand, and in the inner side of its bank they do not much differ in their relative dimensions, but are somewhat of an equal size. The depth of these and of the stratum before mentioned should have been ascertained, but from want of opportunity by the constant fear of wild elephants, from small instruments alone being available, and the impossibility of procuring large instruments, I found the task beyond my power.

6. The coal discovered, from its varied appearance, colour, and quality, would seem to admit of distribution into several sorts, *viz.*, 1st sort, dark, 2nd, less dark, and 3rd, least dark. In some places, by the action of water, the coal has lost its outward colour, and when pressed by the hand crumbles into bits; in other places, the coal lying on the surface is so much engrained with the earth that it is reduced to the same colour with it. I have transmitted by Shaik Boorhan, peon of my Cutcherry, a small quantity of each sort of coal above described, an inspection of which will explain everything.

7. By the time all the above enquiries and examination were completed, it was about midday, and as those who had accompanied me were unable to bear hunger and the exertion of returning at once, and were much fatigued by the long and harassing journey, and as it was, moreover, desirable to verify the presence of wild elephants about the place, the whole party halted in the bed of the river. In the afternoon of the same day, four elephants, one of them a large one with a pair of thick tusks, and the others comparatively small, made their appearance and began to advance towards us. When they approached within 10 or 12 yards of us, one of my peons, who happened to see them first, came running to give me notice. Looking up, I perceived that it would be highly unsafe for us to remain where we were, and finding my party exceedingly alarmed and perplexed, the whole of us took refuge behind the trees on the bank of the river, and notwithstanding all the noise and uproar we made, we totally failed to check or intimidate them, as they with perfect indifference and ease engaged themselves in splashing water, scattering leaves of trees, and feeding on them, which done, they stood still, with their faces turned towards us. We judged it expedient to take up our necessary baggage the best way we could and start immediately, and accordingly again making 16 miles through the same jungle infested with the elephants with great difficulty escaped with our lives in safety, for till we reached inhabited and cultivated parts there was ground for apprehension. The people of these parts state that the big elephant is a furious and wicked one; that it has no fear, and is in the habit of attacking men whenever it sees them; that it has even entered some villages and attempted to kill people, who from fear have deserted their villages. That such a bold and vicious animal should to-day have refrained from attacking us I attribute entirely to the grace of God and the influence of the good fortune of Government which subdues its enemies. We therefore continue thankful to God, the Creator of Heaven and Earth, for the protection and salvation of His servants, and grateful to Government for giving us refuge by its power and perpetual good fortune.

8. My object in entering into such details in the forgoing paragraph in regard to the elephants is to warn any person who may come in this direction hereafter to be on his guard about them, and show the necessity of providing himself with weapons suitable for killing elephants, and, if possible, with the aid of the Government, hunting elephants besides; otherwise, he will risk his own life.

9. I now propose to say a few words in regard to the season suitable for visiting this locality. Information on this point would be useful not only for the security of life and property, but also for ensuring the coal mine being visited and examined with advantage in the most favourable season for such purposes. In the rainy season, apart from the impossibility

of finding a way owing to the density of the woods, the height of the grass, numbers of wild animals, and flood in the river, which presents itself in seven or eight places on the way to the locality, it will not only be impracticable to gain access to the site of the mine, but the mine itself would be submerged by water. As regards the cold weather, although as compared with the rainy season there would not be much flood and vegetation, some obstacles would still exist, and owing to the grass on the ground not having dried up and been burnt, it would be difficult to find a way, and the injurious nature of the water and atmosphere at the period of the year would affect the health of strangers. For the above reasons, then, it would not be advisable in either the cold or rainy season to visit these parts. After their close, in the beginning of the month of February would be the most advantageous period in every respect for the purpose.

10. Although at the present time an opportunity is available of obtaining a cursory view of the coal mine, yet there is very little time left, as this is the 10th of May 1871, and it only wants 26 days for the rainy season to set in. It does not appear likely that an officer from either His Highness's or the British Government can arrive here in such a short interval, nor is there any dependence on the rains, for even in the interval before the rainy season untimely rain-fall might occur in some places here and flood the rivers and channels, as was witnessed a few days ago, when some showers of rain fell in certain places and filled the tanks, ponds, and channels with as much water as to be sufficient for ordinary purposes.

11. Hereafter when it may be proposed to depute an officer to visit the mine, I would suggest the jungle being first cleared, to the width of 10 yards on either side of the road, from above Kamaram to the site of the mine. Although for the present I have caused flags with the words "Ilaqua Sirkari Alee" (Government property) to be put up on two large and lofty trees near the coal mine to indicate its situation, and, as far as possible, smaller marks to be fixed on the trees along the road, so as to lead one straight to the spot, yet these marks cannot be expected to endure long, and I had not the necessary instruments for making more lasting ones.

12. As it appeared to me expedient that some arrangement should be made for the protection of the mine, I have stationed, as a temporary measure, two men of the Koyawar class from those of Dewurlagoodem and other villages of Goondral, and from Mouzah Kamaram respectively, associated with a Police Jowan from the Goondral Thannah, instructing them to keep watch over the mine with the utmost diligence and care, so that no one is allowed to enroach upon it. But the Koyawars have asked for pay, and I would recommend their being salaried at Rupees two each per mensem, and retained for such period as may be deemed necessary. In this matter Government will decide as it may judge fit.

13. I now beg to submit that from first to last I have not omitted the smallest point essential to success in my exertions in the explorations for coal which have fortunately resulted in the discovery of the coal mine under present notice, having kept the object constantly in view during my tours of the talooka, and also employed several persons at my own private expense in this business. Even at the present time, amidst a multiplicity of work connected with the attachment of the Palooncha Estate, and the necessary arrangements consequent on it, and with the annual jumabundy of the talooka under my charge at hand, being conscious that in the rainy season the coal mine will be submerged by water, and the chance of its discovery and examination be thus cut off, I immediately proceeded to the spot through frightful woods and forests, and travelling even by night. Under these circumstances, I indulge the firm hope that by the appreciation of my humble services by Government I shall be liberally rewarded by promotion to higher grades, and by the special favour of the head of the administration be made to enjoy the good fruit of my exertions in this matter.

14. Moreover, to the persons employed by me in the enquiries for coal—viz., 1, Veeriah, goldsmith; 2, Budda Veeriah, shop-keeper; and 3, Luchmoodoo Tilingah, residents of Mouzah Dantalpully in this talooka—I had given hopes of their receiving rewards from Government, besides the expenses of their subsistence, &c., defrayed by myself. I therefore beg that Government will take this matter into favorable consideration, and *satisfy* their reasonable hopes by way of encouragement; for I hear liberal rewards of money, &c., are proclaimed under the British Government for giving similar information.

15. I hope that the Talookdar will, in fulfilment of the promise contained in his memorandum No. 76, bring my labour and exertions to the favorable notice of Government in such terms as he may consider just and fitting, supported with his own kind recommendation, in order that the servants of Government, having received the rewards attached to their good services, may feel grateful and offer thanks. In conclusion, I beg pardon for my presumption.

Ahkam addressed to MAHOMED HANEEF, Talookdar of Yelgundel, under date the 23rd May 1871.

YOUR report dated 17th May 1871, No. 21, submitting a memorandum from Mahomed Ibraheem Ali Khan, Tehseeldar of Talooka Kandeecondah, on the discovery by him of a coal mine, accompanied with a box containing specimens of coal from it, and offering remarks thereon, has reached the Sirkar and afforded high satisfaction, not only by the hope it has inspired of obtaining trace of a source of coal supply, but also as affording the first instance of exertions in this direction, attended as they have been with complete success, on the part of the servants of this Government, under circumstances of great difficulty and labor. The suggestion of the Tehseeldar regarding the felling of trees and clearing a passage is a highly judicious one, and sanction is given to an expenditure even up to Rupees 500, if necessary, for the purpose. Information is required as to the number of men of the Koyawar class necessary to be entertained at Rs. 2 each per mensem for the care of the coal mine; when this is furnished, the necessary sanction will be given. As doubtless the Tehseeldar has shown great zeal and energy, and been at considerable labor and exertion in the exploration and discovery of the coal mine under notice, so soon as it shall have been duly examined a reward of Rs. 2,000 and promotion to the next higher grade of his class will be bestowed upon him. Peremptory orders have again been issued through the Secretary, in the Public Works Department, to Mr. White, Assistant Engineer, now engaged on coal explorations, to despatch some one at once before the commencement of the rains, with a view to the requisite examination being carried out. It would be as well to proclaim at the place that a reward of 200 Hallee Sicea Rupees will be given to any one killing a large elephant, and of Rs. 100 for every other elephant.

From the Resident, to the Minister,—No. 1254, dated 26th May 1871.

WITH reference to your letter No. 1727, dated 25th instant, communicating the discovery of a coal mine by the Tehseeldar of Kandeecondah, and copy of the orders issued by you on the subject, I have the honor to state that I have been highly gratified by the perusal of the whole of the papers in the matter; but it appears to me that if, instead of issuing orders for the destruction of elephants, you had taken measures for capturing them by such contrivances* as are adopted in the Central Provinces, Mysore and Ceylon, it would certainly prove advantageous to your Government, and the elephants caught would be useful for State purposes.

From the Minister, to the Resident,—No. 1828, dated 2nd June 1871.

IN reply to your letter No. 1254, dated 26th ultimo, I beg to state that your suggestion on the subject of catching elephants is highly judicious and proper, and I thank you for it, as it is calculated not only to rid the people of the place of a source of annoyance and trouble, but would also tend to ensure the security of their lives, while the animals themselves would be useful to Government for purposes of riding and carrying baggage and burden. I regret, however, that their capture by the elephant drivers here is out of the question; but I understand that professional elephant catchers are shortly expected at Hyderabad with elephants for sale. If they agree to capture elephants here, their services will be certainly availed of for scatching the elephants in question.

From H. LEPOER WYNN, Esq., Under Secretary to the Government of India, Foreign Department, to the Resident at Hyderabad,—No. 1748 P, dated Simla, the 18th August 1871.

I AM directed to acknowledge the receipt of your letter, No. 8, dated the 3rd July 1871, and of its enclosures, intimating that a valuable seam of coal has been discovered in the territories of His Highness the Nizam.

2. The Viceroy and Governor General in Council has learned of this discovery with much satisfaction, and desires that Sir Salar Jung, as well as yourself, should be informed that the Government of India fully appreciates the value of the action taken in order to place the question of the existence of coal in this part of the country beyond doubt.

3. This correspondence will be published in the *Gazette of India*.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.

IRRIGATION OPERATIONS OF FUL KHURREEF IN THE NORTH-WESTERN PROVINCES UP TO 30th JUNE 1871.

NAVIGATION RETURN, GANGES CANAL.										LAND IRRIGATED (APPROXIMATE).		RAIN-FALL.		REMARKS.	
Principal Items of Traffic.															
WATER DISTRIBUTED DURING THE MONTH.				Nature of Traffic.						Zillah.		Average of ten previous years for the same period.			
DEPTH IN CANAL AT REGULATING GAUGE.		GROSS CONSUMPTION, CUBIC FEET PER SECOND.		Up.		Down.		TOTAL UP AND DOWNS.		Acres.		Total from 1st April 1871 to 30th June 1871.			
Full supply, feet.	Actual throughout.	Estimated full supply.	Actual average throughout.	Mds.	No.	Mds.	No.	Mds.	No.						
CANAL DIVISIONS.															
Northern	10-00	8-48	710	477	Grains—		TOTAL		Saharunpore	17,571	16-7	5-20	The mean volume passing Roorkee gauge during the month was 4,533 cubic feet per second. Volumes discharged— Etawah Branch Tail .. 22 c. ft. per second. " " Escapes .. 583 " " " " Tail .. 244 " " " " Escapes .. 400 " " TOTAL .. 1,240 " " During the early part of the month the demand for water in the terminal Division was merely nominal, and towards the end ceased entirely. Steady rain prevailed up to the 27th, and heavy rain during the subsequent portion of the month. The average condition of crops throughout the month was good. There was a moderate demand in the Upper Divisions during the former portion of the month, but it decreased considerably during the latter. The requirements have been chiefly for sugar-cane, indigo, and cotton, but also moderately for rice "pulleo" and 4th-class crops. The rain-fall during the month was considerable.		
Meerut	8-10	6-82	1,037	205	Wheat		825		Meerutnagar	31,909	5-8	4-78			
Fatehgarh	6-80	3-65	667	724	Gram		4,198		Meerut	55,389	9-0	7-16			
Boohadshahur	6-35	6-06	953	763	Urbur		2,148		Boohadshahur	27,989	5-1	2-80			
Allypore	5-60	5-40	1,033	327	Paddy		46		Allypore	40,404	5-3	3-49			
Etawah	4-80	2-70	771	326	Barley		125		Muttra	5,321	13-1	2-85			
Cawnpore	6-20	5-00	958	772			405		Agra	454	11-2	2-73			
					TOTAL		4,294		Etah	10,497	5-9	2-94			
									Mynpoorie	9,508	11-0	3-62			
									Fatehgarh	6,217	11-3	4-11			
TOTAL				3,604	Cotton		3,800		Etawah	13,392	10-6	8-13	For the first eight days of the month there was only a partial demand for water, it however increased considerably until the 20th, but subsequently ceased, except for rice "pulleo." The canal was closed for the day on the 22nd on account of floods. Whether alternately rainy and clear during the former part of the month, and heavy rain during the latter.		
					Oil-seeds		3,197		Cawnpore	18,521	7-7	3-41		DOON CANALS. Fair demand for rice during the first ten days of the month, which increased until the 20th, but subsequently subsided. Steady and occasionally heavy rain throughout the month.	
					Salt		3,916		Dehra Doon	3,325	25-9	9-18			ROHILKHAND CANALS. Very slight demand. Demand nominal.
					Metals		1,770		Bijnour	381	11-7	6-08			
					Building materials		21,412		Tera	733	29-7	6-45	TRAFFIC RETURN.—Slight increase in transport of grain. Jowille Lock was opened for traffic on the 9th and Nir-ganjee Lock was closed for repairs from the 3rd to end of the month. Owing to these interruptions the rafting trade has ceased, and merchants have been obliged to remove rafts from the water and stack timbers on canal bank.		
					Miscellaneous goods		7,940		Bareilly	6,074	16-3	7-04		Bundelkhand Irrigation Works Rohilkhand Canals	
					Firewood		29,408		Jhansi	81	7-5	4-89			Bundelkhand Canals
					Rumboos		553,640		Humeerpore	287	8-4	3-10				Bundelkhand Canals
					Terra or unsquared timber		6,280		TOTAL		248,053	..	Bundelkhand Canals		
					Karees, or squared timber		7,429		Ful Khurreef 1869-70 to 30th June 1870		248,745	..		Bundelkhand Canals	
					Legs		174		Decrease 1871 ..		9,846	221,002			Bundelkhand Canals
					Miscellaneous timber		46		Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
					Live-stock				Decrease 1871 ..		9,846	221,002	Bundelkhand Canals		
					TOTAL		12,438		Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651				Bundelkhand Canals
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651	Bundelkhand Canals		
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651		Bundelkhand Canals	
									Ful Khurreef 1869-70 to 30th June 1870		91,144	790,651			Bundelkhand Canals

The Terminal Divisions have alternate weeks of high and low water.

P. S. MARINDIN, Capt. R. E.,
Offg. Asst. Secy. to Govt., R. W. P. Irrigation Branch.

ALLAHABAD:
The 30th August 1871.

GOVERNMENT OF INDIA.
DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Statement of Rain-fall and Agricultural Prospects in the North-Western Provinces, Rajpootana, Bengal, and Central India.

(NOTE.—The information in this statement was received too late for insertion in the general abstract published in last week's supplement.)

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	Rain-fall for preceding fortnight.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending	Inches.			
1	N. W. PROVINCES	Benares		Inches.			August 18	Crops suffered a good deal from heavy rain; Cotton and Indigo nearly destroyed. } Hardly any injury done. Prospects good. Good, only land have suffered. } Very good	The rain has almost all come up with a westerly wind; continues cloudy; break in rain wanted.
		Allahabad	.....	3.7	.....	.....	"		
		Agra	.....	5.5	.....	.....	"		
		Meerut	.....	10	.....	.....	"		
		Bareilly	.....	7.8	.....	.....	"		
2	RAJPOOTANA	Serohi, at Erinpoora		3.5			8	Crops promising well; ploughing and sowing proceeding vigorously.	The rain has almost all come up with a westerly wind; continues cloudy; break in rain wanted. Weather rainy. The rain-fall is only for Joudpore for week ending 24th July 1871, but elsewhere there has been more rain, especially in the north and east of Marwar.
		.....	.....	.....	July 29	2.66	"		
		Marwar, at Joudpore	.....	.....	"	2.87	"		

No.	PRESIDENCY OR PROVINCE	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending	Inches.			
		Meywar, at Oodeypore ...	.....	...	July 29 ...	0.78	August 8 ...	The crops all in vigorous growth and have not yet suffered from the want of rain.	Wind generally south-west. Rain seems imminent, but does not fall.
		Eastern States, Bhurtpore..	.....	...	" "	0.8	" "	As bright as could be wished, and the zemindars are sanguine of plentiful Khurreef harvest.	Weather cloudy and humid. The total fall since 22nd June, when register was commenced, is 11 inches.
		Jeypore, at Jeypore ...	.....	...	" "	2.65	" "	Good	Weather very cloudy, wind almost westerly.
		Harrowtee and Tonk, at Deolee ...	.....	...	" "	2.3	}	In Kotah, Jalowar, and Shapoorah young crops beginning to suffer from excess of rain. In Bhoondee, Tonk, and Meenah Districts, good.	During the week the rain has been more or less heavy everywhere, and continued all over country. Wind south and south-west. The rain fall is as recorded at Deolee, Kotah, and Tonk.
		Kotah ...	.....	...	" "	4.5			
		Tonk ...	.....	...	" "	8.7			
		Ajmere and Mairwara Districts, at Ajmere ...	.....	...	" "	4.45	" "	} Good	Wind almost westerly, weather very cloudy.
		Beawur ...	.....	...	" "	5.7	" "		
		Harrowtee and Tonk, at Deolee.	.....	.....	August 5 ...	5.9	August 15 ...	Good	Quite seasonable.
		Tonk ...	.....	.....	" "	0.3	" "	"	A seasonable break has occurred here and at Shapoorah.

RAJPOOTANA, *concl'd.*

Place	August 11	August 12	Remarks
Kotah	...	...	...
Jhallawar	...	...	...
Jeypore, at Jeypore	...	...	...
Serohi, Erimpooza	...	...	...
Eastern States, Bhurtore	...	...	...
Meywar, at Oodeypore	...	...	...
Ulwar	...	...	...
Marwar, at Jondpore	...	...	...
Bhangulpore	August 11	August 12	...
Monghyr	12	...	...
Purneah	7	...	...
Rajmehal	12	...	...
Deoghur	...	...	...
Pakour	11	...	...
Jamtarah	12	...	...
Patna	...	...	...
Gya	5	...	...
Chumparun	...	...	...
Sarun	12	...	...
Shahabad	...	...	...
Tirhoot	10	...	...
Rajshahye	...	...	...

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending	Inches.			
		Bogra	August 11	...	August 12	9	August 15	Cultivation favorably progressing ; more rain needed.	
		Dinagore	5	...	"	1	"	Fair.	
		Maldah	4	...	"	2	"	Crops on more than 10,000 beegahs of land have been destroyed by inunda- tion ; Amun being sown.	
		Moorshedabad	12	...	"	1.6	"	Amun promising ; Amun good.	
		Pubna	5	...	"	1.9	"	Amun partly injured by the over-flow of the Bhageeruthee ; Amun good.	
		Rangpore	12	...	"	1	"	Crops progressing well.	
		Burdwan	5	...	"	4	"	Good.	
		Bancoorah	...	...	"	2.9	"	Favorable.	
		Beerbhoom	...	...	"	1.5	"	Favorable.	
		Hooghly	...	...	"	4.6	"	Flourishing.	
		Howrah	...	...	"	5.2	"	Good.	
		Midnapore	11	...	"	3.9	"	Favorable ; low land inundated	
		Nuddea	12	...	"	1.1	"	Amun being reaped ; Amun good.	
		Jessore	11	...	"	2.3	"	Good.	
		Dacca	4	...	"	4	"	Favorable generally.	
		Backergunge	5	...	"	4	"	Good.	
		Furriedpore	12	...	"	1	"	Good ; no cause of apprehension.	
		Sylhet	7	...	"	2	"	Amun mostly planted out ; the early one has almost failed, but it is not of much consequence.	
		Cachar	5	...	"	2.4	"	Generally favorable.	
		Chittagong	...	...	"	2.5	"	Amun partly damaged ; Amun good.	
		Noacolly or Bulboah	4	...	"	8.1	"	Good.	
		Tipperah	5	...	"	2.7	"	Early crop being reaped ; a good out- turn expected ; Amun good.	
		Cuttack	...	...	"	2.9	"	Flourishing.	
		Balasore	4	...	"	3.8	"	Generally good ; slight injury from inundation.	
		Poorce	...	...	"	6	"	Continuous heavy rains unfavorable for the early crops, but good for others.	
		Hazarebaugh	12	...	"	9	"		

BENGAL, concluded

CENTRAL INDIA									
Lehardugga	...	5	...	...	...	5.1	...	A little too much rain for the Bhadoi crops; Rice excellent. Generally favorable.	...
Maunbhoom	...	12	...	...	...	4.7	...	Favorable.	...
Singbhoom	...	5	...	...	...	2.5	...	Fair.	...
Durrung	...	...	...	...	...	4.8	...	Outs promising; Amun not very favorable for want of rain.	...
Nowgong	...	...	...	...	...	9	...	Fair; Amun plants being transplanted.	...
Sebsaugor	...	...	...	...	...	1.7	...	Want of rain retards the transplantation of Amun crop.	...
Kamroop	...	...	...	...	...	9	...	No apprehension as regards Rice crop. Promising, but wants more rain.	...
Luckimpore	...	4	...	...	...	3.4	...	Amun suffering from want of rain.	...
Julpigoree	...	7	...	...	...	3	...	Good.	...
Gowalparah	...	5	...	...	...	8	...	Same as last week.	...
Garrow Hills	...	...	...	...	...	1.2	...	Fair, if it rains soon.	...
Darjeeling	...	...	...	...	...	2.1	...	Good.	...
Cooch Behar	...	...	...	...	...	...	...	Satisfactory	...
Indore	...	...	...	...	...	5.93	...	Favorable	...
Bhopal	...	...	...	...	...	11.15	...	Fair	...
Gwalior	...	...	...	...	...	...	...	Favorable	...
Bundeleund	...	...	...	...	...	3.2	...	Fair	...
Nowgong.	Agency—	...	...	...	...	...	...	Favorable	...
Bhagelcund	Myhere ...	...	...	...	...	...	...	Ditto	...
Agency.	Nagode ...	...	...	...	...	...	...	Ditto	...
Western Mal.	Schawal ...	...	...	...	...	...	...	Good.	...
wa Agency.	Augur ...	...	...	...	...	6.9	...	Ditto.	...
Rutlam*	Mehidpore	August	5	...	...	10.17	...	...	...
						13.42	...	...	...
Oojein	...	...	...	...	...	17.35	...	Good.	...
Jonrat	...	...	...	...	...	6.47	...	Exceedingly favorable	...
Neemuch	...	...	...	...	...	2.89	...	Previous rain-fall 15.32.	...

Earthquake at 9½ P. M. on 30th July 1871. Ditto ditto followed by a heavy thunder-storm with vivid lightning.

* No rain-gauge.

Rain-fall from 24th to 29th ultimo, inclusive ... 2.22

Rain-fall approximate to 1st instant ... 20

Previous rain-fall ... 23.06

Rain-fall up to date ... 38

Ditto ditto ... 41.03

Ditto ditto ... 38.09

* This heavy fall of rain will be injurious to the Mucka crops if the weather does not clear up; it is favorable to Rubbee crops.

Previous rain-fall 15.32.

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending	Inches.			
			August 5	...	August 5	8.45	August 15	...	Previous rain-fall 54.74.
		Sirdarpore	"	...	"	6.28	"	Promising	
		Dhar	"	...	"	6.94	"	Good.	
		Jhaboon...	"	...	"	10.79	"	"	
		Rajpore	"	...	"	5.54	"	"	
		Maunpore	"	...	"	7.3	"	"	
		Bagorle	"	...	"	4.1	"	"	
		Burwancee	"	...	"	2.1	"	"	In some places Jawre had to be sown twice.
		Janneesa...	"	...	"	5.8	"	"	
		Khull	"	...	"	2.9	"	"	
	C. INDIA, <i>concl'd.</i>	Goonna							
		Bheel Agency							
		Deputy Bheel Agency.							

No. 33

of 1871.



SUPPLEMENT TO
The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 2, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT to the GAZETTE OF INDIA will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA is required by Law, of which it has been customary to publish in the CALCUTTA GAZETTE, will be included in the SUPPLEMENT. For such Orders and Notifications the body of the GAZETTE must be looked to.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

Results of an experiment in the cultivation of "Oosur" Land in the North-Western Provinces.

From COLONEL F. H. RUNDALL, R. E., Deputy Secretary to the Government of India, Public Works Department, to the Joint Secretary to the Government of the North-Western Provinces in the Public Works Department, Irrigation Branch,—No. 391 I, dated Simla, the 19th August 1871.

I AM directed to acknowledge the receipt of your letter No. 708 I—C of the 12th instant, and papers enclosed, describing the results of an experiment in the cultivation of "oosur" land, *i. e.*, land affected by the "reh" efflorescence, in the Allygurh Division, Ganges Canal.

2. In reply, I am to state that His Excellency the Governor General in Council is of opinion, that there is no subject more interesting or important than that of the reclamation of "reh" lands, and considers that all experiments in this direction should be greatly encouraged, and their results most accurately recorded.

3. The present experiment seems to lead to the conclusion that the process of efflorescence is generally a gradual one; that the saline particles come slowly to the surface, and, when caused by the exudation of canal water, can be counteracted by constant, but very deep, cultivation.

4. It certainly appears to be a more promising experiment than those by which "reh" can be supposed to be counteracted by deep thorough drainage, though His Excellency greatly fears that the process pursued and apparently with so much success might have to be every year or at short intervals renewed, to prevent the recurrence of "reh" in the soil.

5. It seems doubtful whether tile drainage and irrigation can be carried on together. All tile drainage shows a disposition to get stopped, but to what extent on most Indian soils water thrown on the surface by irrigation would have the effect of rapidly stopping drains, it is not possible at present to determine.

6. In India, however, where labour is so cheap, and in the irrigated districts chiefly, where the produce is so valuable, an experiment of this kind would be worth trying, and it appears very probable that open drains 100 to 150 feet apart, and about 3 feet deep, might be found sufficient to prevent efflorescence in the intervals, especially if irrigation were constantly in use. These drains will, doubtless, have to be scoured perhaps more than once in a year, but the process in soft alluvial soils would be extremely inexpensive and easy.

7. There may, however, be many descriptions of and causes for saline efflorescences, all of which would probably require different treatment. Although land on which "reh" effloresces is also called "oosur," the true *oosur* is understood to be land free from efflorescence, but is underlaid at a depth of from 6 inches to one foot by a stratum, more or less continuous, sometimes of considerable thickness of kunkur, sometimes in block (known as silia), and at other times in strings and nodules. "Reh" is of course merely a generic name for all saline efflorescences. Sometimes it is an impure sulphate or carbonate of soda, sometimes a *bond fide* chloride of sodium, and sometimes carbonate or nitrate of potash, but generally more or less a mixture of all. It rises to the surface by capillary attraction.

8. In conclusion, I am to communicate to the Government, North-Western Provinces, the thanks of His Excellency for the interesting information afforded in the present papers, and to say that the foregoing remarks should be regarded as suggestions made with the view of eliciting discussion, and that a further report will consequently be awaited of the experiments ordered to be undertaken on the larger scale.

Nos. 392—406 I.

Madras.
Bombay.
Bengal.
Punjab.
Oudh.
Central Provinces.
Sindh.

British Burmah.
Mysore and Coorg.
Rajpootana.
Hyderabad.
Central India.
Ajmere.

COPIES of this correspondence forwarded to the Agricultural Department and the Local Governments and Administrations marginally noted for information, and to the Home Department for publication in the *Gazette of India*.

From R. E. FOREST, Esq., Officiating Joint Secretary to the Government, North-Western Provinces in the Public Works Department, Irrigation Branch, to the Secretary to the Government of India, Public Works Department,—No. 708 I.—C., dated Nynsee Tal, the 12th July 1871:

I AM directed by His Honor the Lieutenant-Governor of the North-Western Provinces

No. 1996, dated 22nd June 1871, from the Officiating Superintending Engineer, 1st Circle, Irrigation Works.

No. 1044, dated 14th idem, from the Executive Engineer, Allyghur Division, Ganges Canal, to the address of the Officiating Superintending Engineer, 1st Circle, Irrigation Works.

Valuation Statement of Oosur Field, reclaimed in the years 1870-71 and 1872.

General Order No. 706 I.—C of 12th July 1871, to Officiating Superintending Engineer, 1st Circle, Irrigation Works.

to refer to your No. 1471 of the 21st May 1869, and to forward, for the information of His Excellency the Governor General in Council, copies of the papers noted in the margin, containing a very interesting report by Captain Parsons, Executive Engineer, Allyghur Division, Ganges Canal, on the results of an experiment in the cultivation of "oosur" land, *i. e.*, land affected by the reh efflorescence.

From CAPTAIN C. S. MONCRIEFF, R. E., Officiating Superintending Engineer, 1st Circle, Irrigation Works, North-Western Provinces, to the Joint Secretary to the Government, North-Western Provinces, Public Works Department, Irrigation Branch,—No. 1996, dated Meerut, the 22nd June 1871.

Cultivation of Oosur Land in the Allyghur Division, Ganges Canal.

In reply to General Order No. 1169 I of 17th April, I have the honor to forward an interesting report by Captain Parsons on an experiment made in his Division by Sub-Conductor McArthur on the reclamation of oosur land. This shews an actual cost of reclamation of Rs. 41 per acre, and a probability that two years' produce would cover this outlay. It remains of course to be seen whether the salts will rise again in the soil or not, and how often the process of trenching and manuring may be necessary. As I think, too, that both Captain

Parsons and Mr. McArther are apt to be sanguine in their views, I am far from looking on this remedy for 'oosur' land as proved. It is, however, a very interesting and so far successful experiment, and I would respectfully suggest that a small sum, say Rs. 500, might be well expended on repeating it on a larger scale. If such a sum would be put at my disposal, I should like to give about Rs. 300 to the Executive Engineer, Allyghur Division, and the balance to the Executive Engineer, Boolundshuhur Division. Sub-Engineer Elahee Buksh attached to the latter division is very well qualified to carry out an experiment of this sort.

From CAPTAIN B. J. PARSONS, Executive Engineer, Allyghur Division, Ganges Canal, to the Superintending Engineer, 1st Circle, Irrigation Works, North-Western Provinces,—No. 1044, dated Allyghur, the 14th June 1871.

WITH reference to your No. 1316, dated 24th April, I have the honor to inform you that two experiments have been made to cultivate oosur land in this Division; one has proved successful, and the other failed. The former was carried out on Mr. McArther's method, and the latter according to the verbal instructions of Dr. Jameson.

2. In July 1870, Mr. McArther took up two pieces of land near the Poordilnuggur Bridge, Cawnpore Branch Canal, within our boundaries, aggregating $1\frac{1}{2}$ acres, on which not even grass would grow.

3. He first of all spread horse, cow, and sheep's dung over the surface to a depth of about three inches, and damped the soil with canal water. On one side across the full breadth a trench was dug one foot deep and one foot wide, and the soil used to make a boundary to the field.

Trench No. 2 was then dug a foot from the first, of the same width and depth, and the soil, well mixed up with the manure, was thrown into trench No. 1.

Trench No. 2 was filled up with soil, in a similar way taken from trench No. 3, and so on, till the whole length of field had been trenched.

4. All clods were carefully broken up, and all small kunkur and rubbish cleared off the ground.

5. Small water-course channels were then made, and the ground divided into plots (kyarees) in the usual way, and a top-dressing of manure and silt of about three inches was roughly mixed with the soil by *phowrah* (hoes).

6. It was then too late to sow rice, so plants nine inches high were purchased, and put in by hand six inches apart after the *kyarees* had been well flooded.

7. The crop was above the average of those in the neighbourhood.

8. After the rice was cut about the 30th November barley and pease were sown. The land was ploughed with a country plough, one way, and then crossed; and the seed was sown in the furrows made by the second ploughing. The crop received the usual waterings, and seemed to be a most promising one, for it was about 4 feet high on the 23rd February when a severe hail storm very nearly destroyed the whole of it. The crop was cut on the 27th March.

9. On the 8th of April, the land was sown with indigo, and in accordance with the system in vogue, the land was first irrigated, and without ploughing, the seed was sown broad cast, and the surface merely scratched over with a *babool* branch.

10. The crop is a most promising one, and there is at present every reason to expect an out-turn of 84 maunds of plant, that is, at the rate of 48 maunds per acre, or 30 maunds per beegah.

11. In the rubbee of 1871-72 wheat will be sown in these reclaimed oosur tracts, and report of the result forwarded in due course.

12. I selected a few days ago a plot of most unpromising oosur land near the Poordilnuggur Bridge, and have directed McArther to prepare this land for the next rubbee.

13. An account current showing the outlay and return herewith accompanies.

14. The other experiment referred to was conducted by Mr. Thornhill in the following way. The piece of land operated upon was about a beegah. Trenches four feet apart, two feet wide, and two feet deep were dug, and the trenches filled in with silt. Twenty-four loads of manure were then spread over the surface, and the land was then ploughed several times, watered and sown with indigo. The plant at first came up very thick, but after having been again watered the ground threw up "reh" which completely destroyed the entire crops.

ALLYGHUR DIVISION, GANGES CANAL.
Valuation Statement of Oosur Field reclaimed, 1870-71 and 1871-72.

Dr.	Fusl.	Value of Produce, &c.	Amount.	Total of each Fusl.	Fusl.	Expenditure.	Amount.	Total of each Fusl.	Cr.
		M. S.	Rs. A. P.	Rs. A. P.			Rs. A. P.	Rs. A. P.	
Khurreef, 1870	...	25 0 Rice (common Scondce) at Rs. 1-4 per maund	31 4 0	50 12 0	Khurreef, 1870	Digging and preparing 1 acre 30 poles ...	64 0 0	86 6 0	
		6 10 Rice, table rice (Lall Dom) at Rs. 2 per maund	12 8 0			Sprinkling above with canal silt ...	3 0 0		
		Rice straw, value	7 0 0			Four days,—two carts carting manure at 8 annas ...	4 0 0		
Rabbee, 1870-71	...	11 20 Barley, at Re. 1 per maund	11 8 0	14 8 0	Rabbee, 1870-71	Purchase and planting rice plants	10 0 0	13 6 6	
		12 0 Bhoosa, at 4 maunds per rupee	3 0 0			Canal water-rate	2 6 0		
						Cutting and clearing from straw	3 0 0		
Khurreef, 1871	...	Estimate 84 maunds Indigo plant, at Rs. 36 per 100 maunds	30 4 0	30 4 0	Khurreef, 1871	Three days plough, at 10 annas	1 14 0	11 3 6	
						Purchase seed grain	1 12 0		
						Tending and top-dressing	5 0 0		
						Canal water-rate	1 12 6		
						Cutting and thrashing	3 0 0		
				95 8 0		Purchase indigo seed	1 7 0	111 0 0	
						Sowing, 8 coolies	1 0 0		
						Clearing, 24 coolies	3 0 0		
						Water-rate	1 12 6		
				15 8 0		Tending and cutting	4 0 0		
		TOTAL		111 0 0		TOTAL		111 0 0	

N. B.—Value of land reclaimed Rs. 32 per acre. The profits of next rubbee's crop will more than clear the account.

B. J. PARSONS, Captain,
Executive Engineer, Allypore Division, Ganges Canal.

SUPPLEMENT TO THE GAZETTE OF INDIA, SEPTEMBER 2, 1871. 1201

Memorandum from R. E. FOREST, Esq., Officiating Joint Secretary to the Government of the North-Western Provinces, to the Officiating Superintending Engineer, Public Works Department,—No. 706 I—C, dated Nynce Tal, the 12th July 1871.

THE undersigned is directed by His Honor the Lieutenant-Governor of the North-Western Provinces to acknowledge the receipt of Officiating Superintending Engineer's letter No. 1996 of the 22nd ultimo, and to request Captain Moncrieff to convey to Captain Parsons the thanks of His Honor for the interesting and intelligent report submitted by him on the results of experiment in the cultivation of "oosur" land in the Allyghur Division, Ganges Canal.

2. A further statement will be looked for of the condition and bearing powers of the successful plot in reference to the ensuing khurreef harvest, how far it continues fertile or shows symptoms of recurring reb and barrenness. No absolute conclusions can be formed till we have had a longer and wider experience. Eventually, if the experiment succeeds, the papers will be published ; in the meantime, they will be forwarded to the Government of India for information.

3. His Honor has been pleased to direct that an assignment be made of Rs. 500 from item No. 97 of current year's budget, to enable further experiments being made on a larger scale in the Allyghur and Boolundshuhur Divisions, Ganges Canal ; of the sum of Rs. 500 now allotted, Rs. 300 are assigned to the former, and the balance to the latter division.

IRRIGATION OPERATIONS OF LOWER BENGAL UP TO 30th JUNE 1871.

Circle.	Canal.	WATER SUPPLIED DURING 1871-72.				APPROXIMATE AREA IRRIGATED DURING JUNE 1871.				RAIN-FALL.				NAVIGATION RETURNS.						CHIEF IRRIGATORS.		REMARKS.
		Full supply depth.	Estimated full discharge in cubic foot per second.	Average depth throughout the month.	Average discharge in cubic foot per second throughout the month.	District.	Area actually receiving water during month, in acres.	Of column 8 area receiving water for the first time during current year.	Total of columns 8 and 9 for all previous months of current year.	Total area irrigated up to date during the current year.	Inches during the month.	Inches up to date during the year.	Average of ten previous years for the same period.	Nature of Traffic.	Number of Boats.	Tonnage.	Ton mileage.	Approximate value of goods.	Per column 8.	Per columns 8 & 9.		
1		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Orissa	High Level ..	8	675	3-62	214	Cuttack	3,265	3,265	..	2,265	7-44	17-41	15-66	Local Govt.	86	243	2,704	998	Rice ..	Rice.	102-547 cubic feet per second escape.	
	Kendrapara ..	7	1,302	4-43	600-624	Ditto	2,650	2,650	..	2,650	7-44	17-41	15-66	Local Govt.	128	318	7,919	16,301	Rice ..	Rice		
	Taldunda ..	8	1,300	6-75	Still water.	Ditto	500	500	..	500	7-44	17-41	15-66	Through Govt.	358	731	16,040	2,19,364	Rice ..	Rice		
South-West-ern.	Midnapoor ..	8	875	5-28	73-82	Midnapoor	5,963	5,797	106	5,963	9-40	23-30	22-61	Local Govt.	97	176	672	3,645	Rice ..	Rice	Ranges 1 and 3 closed for repairs.	
	Panchkoora..	6	240	1-60	173-8	....	..	..	..	..	10-85	24-00	Not known.		97	176	672	3,645	Rice ..	Rice		
						Total	12,378	12,312	106	12,378												
Orissa	High Level ..	..	..	..	..	Cuttack	..	..	47	47	..	..	..		..	..	..	..	..	..		
	Kendrapara ..	..	..	..	..	Ditto	11	..	2,151	2,151	..	..	..		..	..	..	..	..	..		..
	Taldunda ..	..	..	..	..	Ditto	..	..	..	..	..	..	..		..	..	..	..	..	..		..
South-West-ern.	Midnapoor ..	..	..	..	..	Midnapoor	10,558	10,558	35	10,593	..	..	..		..	..	..	..	..	..		
	Panchkoora..	..	..	..	..	Midnapoor and Howrah.	..	..	..	..	..	..	..		..	..	..	..	..	..		..

NOTE.—Decrease in area of irrigation in Midnapoor owing to the heavy rains, whereas during the month of June last year little rain fell.

The 1st August 1871.

T. M. KIRKWOOD, C. S.,
Caval Revenue Supt., Bengal.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Conservancy of Forests in Raneekhet.

From MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Secretary to the Government of India, Public Works Department,—No. 143 F—C, dated Nynsee Tal, the 12th August 1871.

IN continuation of this Office No. 103 F—C of the 24th July, I am directed to forward, for the information of the Governor General in Council, copy of a memorandum No. 140 F—C, dated 12th instant, issued to the Conservator of Forests, regarding the conservancy of the Raneekhet forests.

2. The Government of India will observe that in respect of the forests within cantonments limits, the Forest Officer will be merely the adviser of the Cantonment Magistrate and Executive Engineer.

Memorandum from MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Conservator of Forests, North-Western Provinces,—No. 140 F—C, dated Nynsee Tal, the 12th August 1871.

WITH reference to the Notification of the 24th July, placing the forests of Raneekhet within a radius of 12 miles round Koompore Hill under the forest laws, copy of which Notification was sent to Conservator with No. 111 F—C of same date, requests that the Conservator will at once send the Kumaon Forest Officer to Raneekhet to be stationed there, in accordance with the arrangement which was lately discussed between Conservator and Assistant Secretary, and which has received the approval of His Honor the Lieutenant-Governor.

2. Lieutenant Campbell who, it is understood, is the officer in question, should mark out the 12-mile limit at once, and the conservation of the forests within that limit should be strictly enforced so far as the forest lands are concerned, and a map will be prepared in communication with the Commissioner of Kumaon showing the village lands, Troup's estate, and cantonments within the main boundary, and which will be hereafter exempted from the forest laws.

3. The Forest Officer will be responsible for *advising* in all matters within cantonments, but not for the executive charge which will rest in the hands of the Executive Engineer. The latter will act in respect of the forests in cantonments (and also in respect of the Troup estate) in concert with the Cantonment Magistrate and Forest Officer.

From A. O. HUME, Esq., C. E., Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, to the Secretary to the Government, North-Western Provinces, Public Works Department,—No. 200, dated Simla, the 31st August 1871.

I AM directed to acknowledge the receipt of your letter No. 143 F—C, dated 12th instant, forwarding a memorandum of instructions to the Conservator of Forests, regarding the conservancy of the Raneekhet forests, and to state that it is the wish of the Governor General in Council that the regulations and restrictions therein prescribed should also be made applicable to the hill called Sir Devi, which lies between Raneekhet and Almorah, and which is approached by the Runi Spur.

Report by the Government Quinologist, Madras, of the results of the analyses of specimens of Cinchona bark sent from Mahableshwur.

From MR. BROUGHTON, Government Quinologist, to the Acting Secretary to the Government of Fort St. George, Revenue Department,—dated Ootacamund, the 14th July 1871.

REFERRING to G. O. No. 1067 of 15th June 1871, I have the honor to state the results of the analyses of two specimens of red bark from Mahableshwur, in order that they may be communicated to the Government of Bombay.

2. The specimens of bark differed in appearance from most of the India grown bark of *C. Succirubra*, by having a thicker corky envelope which had partially scaled off its surface in many places, and thus altering its aspect. This was more especially the case with the elder bark. The analyses are given in percentages of dry bark:

No. I.—*C. Succirubra* bark, four years' old.

	Per cent.
Total alkaloids	5.95
Quinine	1.03
Quinidine and other alkaloids ...	4.89
Sulphate of quinine obtained crystalized ...	0.75
Sulphate of quinidine and cinchonidine ...	3.16

No. II.—*C. Succirubra* bark, three years' old.

	Per cent.
Total alkaloids	5.34
Quinine	0.67
Quinidine and other alkaloids ...	4.57
Sulphate of quinine obtained crystalized ...	0.39*
Sulphate of quinidine and cinchonidine ...	2.48

Hence in gross yield of alkaloid, these barks are of good quality, the elder being of course the better. They bear all the marks of being grown at a lower elevation than those of the Nilgiri plantations. It will be observed that they contain little quinine. The most remarkable quality of the barks is, that they contain but little cinchonidine compared to the usual yield of red barks; that alkaloid being nearly entirely re-placed by quinidine, an alkaloid of somewhat greater value, and not hitherto found in any large quantity in Indian barks. Hence after the quinine is removed, a solution of the sulphates rotates the plane of polarization of a polarized beam to the right. The occurrence of this alkaloid is a circumstance of much interest. Cinchonine is also present, and is excluded from the above statement of crystalline sulphates.

Notes on the Bombycidae, as at present known to us, by Captain Thomas Hutton, F. G. S., C. M. Z. I., Corresponding Member of the Agricultural Society of India, — dated Mussoorie, the 26th July 1871.

BOMBYCIDÆ.

1. *Bombyx mori*.—(Lin.)—The largest of the domesticated Chinese Bombyces, originally from China, about North Latitude 32° to 34°. Also in Japan. This has been cultivated in Europe, especially in France and Italy, as well as in Syria, Egypt, Persia, Bokhara, Afghanistan, Cashmere, in one or two localities of the Northern Punjab near the hills, and thrives well at Mussoorie, everywhere feeding upon various species of mulberry and everywhere an annual, only *except* at Mussoorie, where I can obtain two crops. This is the worm that lately failed in France after centuries of domestication. It occurs *nowhere in the lowland Gangetic Provinces*, but its name is assigned, in ignorance, to *all* the under-mentioned species. "Where ignorance is bliss, 'tis folly to be wise," and after all, "what's in a name? a rose by any other name would smell as sweet!"

This species has been introduced into Australia where it is said to thrive well, although Dr. Wallace of Colchester has lately informed me that Australian eggs do not hatch so kindly and regularly in England as English bred eggs; instead of coming forth in a swarm, they appear daily in small quantities only. This I attribute to the high temperature of Australia having acted injuriously upon the constitution, which is debilitated.

The best silk of all is produced by this species, and readily sells, with good reeling, at 25 shillings per lb. Mr. Cope sold some at that rate which he produced in the Punjab; and that reared at Mussoorie fetched the same price. A splendid silk

is produced by crossing this species upon the smaller monthly worm known in Bengal as the *désee*, but the crossing requires great attention, and the out-turn after all may not be worth the trouble, for unless very closely watched and attended to, the worms will invariably revert to annals. Silk—golden yellow when in health.

2. *Bombyx textor*.—Hutton.—This species is cultivated sparingly in several parts of India, but its constitution is thoroughly worn-out, and it ought to be sent to a hill climate. At Mussoorie it thrives well, and although like the last, an annual everywhere else, here it yields a second or autumnal crop also. It was originally brought from China, near Nankin, in North Latitude 32°, but is fast fading away from Bengal. It is cultivated in France and Italy and in China, as well as in Bengal, and in those countries generally produces a pure white silk; in Italy there are more white than yellow cocoons, but in France more yellow than white; this is dependent upon climate, as is well shown at Mussoorie where worms introduced from Bengal produce *white* cocoons for the first crop, but almost all yellow in the second crop. The worm being northern, is impatient of heat and suffers accordingly in constitution, the silk in consequence becoming white, which, as I have elsewhere pointed out, is generally a sign of loss of constitution, not only among silk-worms, but among animals still higher in the scale of nature; the natural colour of the worm of *Bombyx mori* is nearly black-brindle, whereas the worms under domestication are of a sickly creamy white. So, then, the climate of France being more temperate than that of Italy, produces more yellow than white cocoons. This species is often termed the Milanese or Italian stock, and in Bengal is known as the Burra pooloo, because its cocoon is larger than those of the so-called *désee* worms or polyvoltines.

It is cultivated in Assam and, according to Dr. Royle, is there and elsewhere called "*Pat major*," although it is invariably confounded with *B. mori*, than which it is at least an inch smaller, though in other respects closely resembling it. The cocoons are of a different texture with more floss. The silk varies in price from 18 to 22 shillings per lb. Unless it be very soon transferred to the hills, this species will certainly die out; here I *could insure its life* without difficulty.

3. *Bombyx Cressi*.—Hutton.—This is the largest of the monthly worms, and in Bengal passes under the Native name of the Madrassee or Nistry, and is as usual confounded by Europeans with *B. mori*, although the one passes as an annual, and the other as a monthly worm.

The silk is good, of a golden yellow, and the worms thrive best in a temperate climate; in Assam (*apud* Royle) it is known as "*Pat minor*." This species is cultivated in several parts of India, and thrives well at Mussoorie. It is to be particularly remarked, however, that none of the Chinese species, whether annual or monthly, have hitherto succeeded in the North-Western Provinces, Dr. Royle long since remarking that all the Old Company's Filatures did not extend higher up the country than about 26° of North Latitude, owing to the dry hot nature of the North-Western climates.

4. *Bombyx fortunatus*.—Hutton.—Known to the Bengalees as the *désee* worm, and like the others dignified by Europeans with the name of *B. mori*. Silk—golden yellow, distributed over Bengal and other parts of Southern India; but people know so little of the distinguishing characters of species, that it becomes very difficult to say what species is alluded to in magistrates' reports unless the native name is mentioned. This also is one of the polyvoltines. A sure mark of distinction between the worm of this species and that of any of the others exists in the fact that when near maturity, it becomes of a dull leaden blue color. This species thrives best in the cold weather. It is very small, but yields a good cocoon, although the returns of silk are said to be uncertain; there are no dark worms observable among them. The worm is figured in the second part of my paper "*On the Reversion and Restoration of the Silkworm*," as published in "*The Transactions of the Entomological Society of London*"—(*quod vide*.)
5. *Bombyx Sinensis*.—Hutton.—This is known as the "*Sina*" of Bengal, but, like the others, it originally came from China; it is very prolific, and even at Mussoorie goes on yielding crop after crop, up to the middle of December. The cocoons vary in colour, some being white and others yellow, while others even have a beautiful faint greenish hue. These changes clearly show that the health of the worm is becoming impaired. There is a peculiarity about these also which may enable the tyro to distinguish them from any of the others; while all the other species hatch slowly during the morning, from six to twelve o'clock, the *Sina* worms come forth all in a batch, of continue hatching all day and all night.
6. *Bombyx Arracanensis*.—Hutton.—This I have only once been able to procure and the worms died off soon after hatching. The cocoon is said to be larger than those of the Bengal monthlies, but very little beyond the fact of its existence appears to be known,

and people are so apathetic in these matters that letters, as a rule, remain unanswered. As the species is supposed to have been introduced from Burmah, it may probably turn out to be the same as that which was lately reported to exist in Burmah.

7. *Bombyx* ———? I have heard of a species which in Central India is said to yield three crops of silk in the year, and that as soon as they are hatched, the worms are placed out upon mulberry trees and left there until they spin the cocoon. Some of the cocoons were kindly sent to me, but were so crushed in transit that they were destroyed; the cocoons were small, but silk good, of a pale colour and something like those of *B. fortunatus*. I wrote for more cocoons and eggs, but my application has been unattended to, although my correspondent promised to assist me. I shall try again.

The following, with the exception of *B. Huttoni*, are little known. Mr. F. Moore wishes to place them in a separate genus under the name of "*Theophila*," one of his chief characters being the rows of spines on the larvæ; I object, however, to the establishment of this genus, because, in truth, we know little or nothing about them, and as to the spines, two species only are as yet known to possess them; nevertheless, they certainly do not stand properly under the genus *Bombyx*, but we must wait yet awhile in order to ascertain whether all can be included in the same genus.

8. *Bombyx* (*Theophila*) *Huttoni*.—Westwood.—This is a wild mountain species, feeding on the indigenous mulberry of Simla, Mussoorie, and Almorah. I first discovered it at Simla in 1837, and afterwards in great abundance at Mussoorie. In some years they swarm to such an extent, that by the end of May, the worms of the first, or spring brood, have thoroughly denuded even large forest trees, not leaving a single leaf. In this predicament they quit the tree in search of another which they generally find near at hand, and which is then soon thickly covered with cocoons spun in the leaves; but if, unfortunately, they fail to find a tree at hand, the whole brood perishes, the most forward worms spinning cocoons among shrubs and grass. The trees thus denuded instead of dying, are in another month once more in full leaf, as if nothing had happened.

It is a strong and hardy species, yielding a beautiful soft, whitish silk, and although the worm is too intractable and wandering to be treated in the usual manner in the house, yet I am by no means sure that it cannot be turned to good account by collecting the cocoons from the trees, as was evidently done in the outset by the Chinese with respect to *Bombyx mori*. For a full report I refer the reader to my paper Part II., "On the Reversion and Restoration of the Silk-worm," published in the "Transactions of the Entomological Society of London."

9. *Bombyx* (*Theophila*) *Bengalensis*.—Hutton.—If the species discovered some years ago in Bengal by my friend A. Grote, Esq., is correctly figured in my paper No. 2, just alluded to, then that sent to me from Chota Nagpore in 1869, by Mr. King, must be distinct, for it is in all respects as to shape, colouring, markings, &c., a perfect miniature of *B. Huttoni*; that it is distinct, however, is shown in the smaller size both of larva and imago, as well as in its being a polyvoltine instead of a bivoltine like *B. Huttoni*. In Chota Nagpore the food was the leaf of *Artocarpus Lacoocha*, upon which tree likewise Mr. Grote found his specimens; but as the latter gentleman was in the habit of employing an accurate native delineator of insects, I much doubt any error occurring in the figure kindly supplied by him to me, and therefore am inclined to regard Mr. King's species as distinct from Mr. Grote's, and would term the Chota Nagpore insect *Bombyx* (*Theophila*) *affinis*, (nob.) in reference to the remarkable affinity to *B. Huttoni*, in all its stages.

10. *B. affinis*.—Hutton.—When the young worms hatched at Mussoorie, from eggs and cocoons sent from Chota Nagpore, I had no leaves of *Artocarpus* within some miles and was sadly puzzled to feed the worms; I tried, without success, the leaves of wild fig trees, *figus venosa*, *morus nigra*, *morus sinensis*, *m. multicaulis*, *m. cucullata*, *m. serrata* (wild), but all to no purpose, and I had almost made up my mind to lose the species, when it suddenly occurred to me to try the leaves of *m. indica*. With these I succeeded, the young worms riddling the hard, coarse leaf into a perfect sieve in a few minutes. Like *B. Huttoni*, in the two first stages they were dreadfully troublesome, wandering down from the branches and spreading all over the table, but as they grew larger they became more tractable and remained tolerably quiet, eventually spinning their cocoons in the leaf like *B. Huttoni*.

When the moths appeared, there was equal difficulty in getting them to pair, and then even many of them laid no eggs; those that did so, deposited them in batches and then covered them over thickly with the brush or tuft of hair at the end of the abdomen; thus the eggs of *B. Huttoni* are pale straw colour, glued to the trunk or branches of the tree, and quite naked, whereas those of *B. affinis* are of an orange colour and covered with dark hair. This renders it difficult to

detect them on the bark, and the covering is probably used as a non-conductor of heat. The eggs of *B. Huttoni* are scattered along the under side of the small branches or over the bark of the trunk, whereas those of *B. affinis* are placed in patches or groups, and none of the eggs that remain without a coating of hair ever produce worms. I obtained four broods, the last being reared on the trees of *M. nigra* in the open air. I am sorry to add that none survived the winter, although the cocoons were kept in a room with a fire; thus, after all my trouble, I lost the species. The silk resembles that of *B. Huttoni*, and is equally good, although from the smaller size of the cocoons there is less of it.

Mr. Grote kindly sent me a specimen of his moth which arrived, as usual by post, quite crushed; the specimen, however, as far I can remember, was whitish and very much smaller than that of *B. affinis*.

11. *Bombyx* (*Theophila*) *subnotatus*.—Walker.—Nothing more is known of this species than is contained in Mr. Walker's description of the moth, and that it was procured from Singapore by Mr. R. A. Wallace; neither the larva nor its food is mentioned.—(*Vide Proc. Linn. Soc. Lond. iii. Zool.*, p. 188. (1859.)

Whether this be a true *Theophila*, we cannot tell.

12. *Bombyx* (*Theophila*) *Sherwilli*.—Moore.—This is closely allied to *B. Huttoni*, but the larva is unknown; all that has been ascertained is that the specimen was obtained from a collection made by the late Major J. L. Sherwill, but whether captured in the plains or at Darjeeling, no one knows. People who have often collected at Darjeeling assure me they never saw the species there; hence I incline to regard it as a lowlander, feeding on *Artocarpus* perhaps. All that Moore says of it that it is "allied to *B. Huttoni* and differs from it in being somewhat larger, and of a grayer colour, the fore-wing having the apical patch, fuliginous instead of black, and it has only a single transverse discal streak (instead of the two as in *B. Huttoni*). A most prominent character is that the abdomen is tipped with black, as well as having the dark waistband."
13. *Bombyx* (*Ocinara*) *religiosa*.—Helfer.—Although this stands as a *Bombyx*, the entire description as given by Dr. Helfer applies rather to a species of *Ocinara*. It is called the Joree silk-worm by Helfer, and the Deo-mooga silk-worm by Mr. Hugon. It is said to occur in Assam and Sylhet; but I have failed to elicit information from those localities. Bombyces are far less erratic than the allied genera of *Theophila* and *Ocinara*, and if indigenous in any district, there they will remain year after year, sometimes in greater, sometimes in lesser, numbers; but *Theophila* and *Ocinara* are both inconstant; plentiful one year, absent altogether the next, and with the latter sometimes for two or three years. Hence Grote for or four or five years lost sight of *Theophila Bengalensis*, and no one seems to have seen Helfer's *B. religiosa* since the time of its discovery.
14. *Ocinara lida*.—Moore.—This species is found at Mussoorie where it feeds upon the leaves of *Ficus venosa*, the larva being very like that of a geometra, and spinning a small white cocoon on the leaf or against a stone beneath the tree. It is too small to be serviceable. I named it after Mr. F. Moore, but he tells me it is the same as the Javanese *O. lida*. It is a multivoltine. It feeds on the wild fig also.
15. *Ocinara lactea*.—Hutton.—This also occurs at Mussoorie, feeding on *Ficus venosa* and spins a curious little cocoon of a yellow color, within the leaf; over the cocoon is laid a net-work of yellow silk, too small to be of use. It has several broods during the summer. The larva is smooth, whereas that of the preceding is hairy.
16. *Ocinara comma*.—Hutton.—The moth of this is white, with a dark comma-shaped mark on the disc of the upper wings; hence the name. It occurs both in the Doon and at about 5,500 feet of elevation below Mussoorie.
17. *Trilocha varians*.—Moore.—Is a small species found in Canara; and again by Mr. Grote in Calcutta. As a silk-yielder, it is of no value.

For further remarks on these species, consult the second part of my paper "On the Reversion and Restoration of the Silkworm."

18. *Cricula trifenestrata*.—This handsome and curious species is found in various parts of India, sometimes in such numbers in the larva state as to become a perfectly destructive pest; it denudes the mango trees of every leaf, destroys the foliage of the cashew-nut, and is even said to attack the tea plants. It occurs in Burmah, Assam, Moulemein, and Chota Nagpore in Central India. The cocoons are formed in clusters, so closely interwoven, that they cannot be separated for reeling, which, indeed, their very texture prohibits; they are therefore carded, but are not much used; the

cocoons are very irritating, from a number of minute bristly hairs from the caterpillars. I am inclined to think there are two species now standing under this name : as some cocoons are very much reticulated, while those from other localities are far more closely-woven and scarcely reticulated at all. This will never prove productive as a silk-yielder, unless the cocoons can be reduced to a gummy pulp, and used for some other purposes.

- 19.—*Antheraea paphia*.—Linn.—This handsome species is distributed all over India from Burmah to Bombay ; but it has to be observed that there are in this wide range several distinct species included under the name. To separate these effectually must be the work of time, and until it is done, there can no really good Tusseh silk be produced. That several of these species are capable of producing a very valuable article of commerce is an undoubted fact, and from its cheapness and durability it would be a boon to that class of the British population which cannot afford to indulge in expensive silks. There is a stupid outcry against Tusseh silk now raised at home by some of the would-be-knowing ones, who are quite ignorant of the fact that they are not sitting in judgment upon a genuine article, but upon one compounded by the natives by the mixture of the silks of three, if not four, distinct species whose fibres are of different thickness. Take the silk of any one un-crossed species and reel it as carefully as is done with the produce of the Chinese Bombyces, and these cavilling quidnuncs who do not know one species from another, would soon sing to a different tune.

At present the native method is this : At the season when the cocoons have been formed, the jungles swarm with them, and men sally forth to pluck them from the trees. These jungles, however, contain several distinct species, a thing of which the natives are profoundly ignorant ; these cocoons are all promiscuously huddled together, placed in hackeries, and carted off to the dealers. They are then sorted according to size, thickness, colour, &c., and named accordingly as a kind of trade mark, but without any reference to species. The cocoons selected for reeling are treated in the roughest manner and all kinds spun off together ; those that are kept for breeding are allowed to eat out of the cocoon, as it is termed, and to interbreed, still without reference to species ; and as this has been going on from time immemorial, of course the species have become blended into a most confusing cross-breed. Hence it results that if a dozen cocoons are taken at random, no two moths will probably resemble each other.

This system of crossing is not confined to the Tusseh group. I have detected it more than once in what were termed Japan worms imported direct from that island ; indeed, I have not only detected the cross, but I have succeeded in separating the species which composed it ; in one instance, I found *Bombyx mori* crossed with *B. Sinensis*, and on another occasion *B. Textor* and *B. Sinensis*. In the case of domesticated species there is no great difficulty to contend with, but with regard to the wild species the thing is very different, and, in short, I can scarcely yet say that I see my way at all clearly. In the Dehra Dhoon and extending up the hill side to about 4,500 feet, or perhaps more, we have two species of Tusseh, one of which is also found in Central India ; what the other is, I am not yet prepared to say. Here, however, we have no artificial crossing, so that our species may be regarded as types. The difficulty is to get the sexes of two moths showing marks of relationship to come forth at the same time, so as to obtain a brood and compare the larvæ with others. To trust to the reports of the unscientific would only add to the confusion ; a gentleman residing in one of these silk districts kindly furnished me with cocoons of what he declared to be distinct species, and furnished me with voluminous notes, but neither the one nor the other furnish the slightest data upon which I can work or depend ; that a cross exists I can see, but my correspondent is not able to enter into my views and wishes. To visit the jungles myself at the season when the worms appear is out of the question, and the cocoons afford no information. Nevertheless, I shall continue to collect hints from all who may be kind enough to give them.

20. *Antheraea nebulosa*.—Hutton.—This is one of the species that has been crossed upon *A. Paphia*, and it seems to be not uncommon throughout Central India. It is a well marked species, and as specimens have been sent to England, we shall soon hear what the opinion is, provided the moths arrive in safety. The silk would probably rival that of *A. Paphia*.
21. *Antheraea* ———?—I refrain from naming this until I can obtain more specimens ; it is found in Central India and in the Dehra Dhoon. It is quite distinct from either of the foregoing.

22. *Antheræa Pernyi*.—Guér. Mén.—This species was discovered in Mantchouria to the north of China, where it feeds on the oak. According to Mr. Atkinson, of the Educational Department, Calcutta, he has captured two specimens of what he declares to be this species, at Darjeeling; these flew to a light placed out in the evening, but nothing further was ascertained. The great difference between the climates of Darjeeling and Mantchouria calls especial attention to this discovery, and leads one to wonder that the species has not been detected at Mussoorie and Simla, both farther to the north. It would be as well if Mr. Atkinson would give his attention to the subject, and enable us to bring it under cultivation.
23. *Antheræa Yamamai*.—Guér. Mén.—This is a Japan species and is well thought of both in England and in France where great efforts have been made to introduce it, but as yet with very indifferent success. Last year I received through the kind offices of Dr. Wallace an ounce of these eggs direct from Japan, and found them to thrive admirably on our hill oak; unfortunately my means were not adequate to the undertaking, as gauze covers were found to be indispensable in order to ward off the attacks of insects, such as bugs, the larvæ of coccinellæ, spiders, &c., and as some of the young trees were about six feet in height, the expense was greater than I cared to undertake, as I was certain of no reward. However, the experiment was suddenly cut short in one night when the worms were in the fourth stage, by the incursion from below of a swarm of large black ants which carried off every one, so that like Lord Ullin, "I was left lamenting." The species however is well worth another trial if only for my own amusement.
21. *Antheræa Assama*.—This is the Mooga or Moongah worm of Assam which produces a very excellent silk, which, if well reeled by skilful hands, instead of being carded, would be extremely valuable. I have found this species in the Dehra Doon feeding upon a tree known to the natives as "*Kirkee*," but I only procured one male and have not since seen another. I am searching for it, as there must be more than one.
22. *Antheræa Perrottetti*.—Guér. Mén.—Said to occur at Pondicherry, but although I long ago applied to the late Mr. Perrottet, he could not procure any specimen of it, although he sent *Antheræa paphia* (vera) and *Actias Selene*.
I am half-inclined to regard it as a mere variety of *A. Paphia*.
23. *Antheræa Helfer*.—Is found at Darjeeling, the cocoon resembling that of the common Tusseh; but no one seems inclined to do more in those regions than collect the moths.
24. *Antheræa Frithi*.—Is another Darjeeling species, of which we know no more than of the last. At that station, where species are abundant, no one ever does more than collect the imago.
25. *Antheræa Royle*.—Moore.—Is common at Simla, Mussoorie, Almorah, and, I think, Darjeeling. It feeds upon the common hill oak, spinning a large but thin cocoon between three or four leaves. I found it at Simla in the winter of 1836 by following a flock of tom-tits, one of which, after a time, began tapping so loudly that I hastened to the spot and found the little fellow hard at work on the outer cocoon from which I drove him off and pocketed the prize. The outer coating is very strong, and I do not think it could be reeled; but within this case is the true cocoon, of an oval form and yielding a good silk. The worms are easily reared, and sometimes give two or three crops, but this is when treated in the house.
The males will couple with *Antheræa Paphia*, but the produce never comes to anything.
26. *Antheræa* ———?—This is a species occurring near Bombay and discovered by the Messrs. Robertson, of the Civil Service, who regard it as allied to *A. Yamamai* of Japan. They have very kindly promised to send me cocoons as soon as procurable. From the rough sketch of the cocoon which Mr. E. P. Robertson sent me, it certainly appears to differ from *A. Paphia*, though I do not think it can possibly be *A. Yamamai*.
27. *Antheræa* ———?—Nothing is known of this species, except that I possess a well formed (probably male) cocoon of about the size of one of the *Bombyx mori*; the peculiarity exists in there being no vestige of a pedicle or safety rope, the cocoon being equally perfect at both ends. Unfortunately, during repeated illnesses, the label has been lost, and I have not the least recollection of where it came from or who sent it, although I incline to think it came from Madras through the kind offices of Mr. A. H. Blechynden. I am particularly anxious to obtain living specimens of this which is not only an undescribed species, but promises to be a valuable silk-yielder.
These remarks will serve to show how much scientific work yet remains to be done in this single genus of *Antheræa*.
28. *Attacus Atlas*.—Linn.—This the largest of the real silk spinners. Is common at 5,500 feet at Mussoorie and in the Dehra Doon; it is found also in some of the deep warm glens of the outer hills. It is also common at Almorah where the larva feeds almost exclusively upon the "*Kilmorah*" bush or *Berberis Asiatica*; while at Mussoorie it will not

touch that plant but feeds exclusively upon the large milky leaves of *Falconeria insignis*. The worm is perhaps more easily reared than any other of the wild Bombycidae, producing a very large and well-stuffed cocoon of a grey colour and somewhat difficult to unwind; a strong ley of potash appears to be the best solvent. The species is also abundant in Cachar, Sylhet, and is found also at Akyab, in Arracan, as well as in China.

29. *Attacus Edwardsi*.—This species was discovered at Darjeeling and is much darker in colour than the other, and rather smaller in size, but nothing seems to be known of its food and silk.
30. *Attacus Cynthia*.—Abundant at Mussoorie, feeding on various wild plants; common in China where it feeds on *Ailanthus glandulosa*; found in Assam, Cachar, Saugor. Although it is commonly reported to be under cultivation in different places (*vide* Colonel Agnew's Assam Report), yet such is not the case, the *Attacus ricini* being in India invariably mistaken for it. Indeed until a few years ago, when I pointed out the fact, *Attacus Cynthia* was not known to occur in India, the other species passing under that name, as the silk-worms did under that of *B. mori*. *Attacus Cynthia* has been imported into France and England and reared out in the open air on trees of *Ailanthus glandulosa*; it has likewise succeeded to some extent in Australia, and I believe they have it also at the Cape of Good Hope. There are difficulties attending the reeling of the silk as there is with all the *Attaci*, but nevertheless the French have succeeded in turning out some very good silk pieces. In England it is not quite so highly thought of as it once was. In Australia Mr. C. Brady has produced silk from it.
31. *Attacus Ricini*.—This is the worm that produces the silk known to the natives as the Arrindy silk; it is easily reared and feeds on the castor oil plant *Ricinus communis*. The silk is obtained by carding. The chief places of cultivation are Assam, Rungpore, and Dinagepore, in Eastern Bengal, *not at Dinapore*, as stated in one of Dr. Bennett's reports. It is also cultivated in smaller quantities in other places. The Mekirs to the eastward possess a very fine kind with white silk. *Attacus ricini* thrives well at Mussoorie, and has been introduced into France, Algeria, Malta, and other places.
32. *Attacus Guerini*—Moore.—Is known only from a few specimens of the moth in some museum in England, and I am induced to regard it as no more than an ill-fed specimen of *A. Ricini*. I have failed to procure it from any part of the country, though I have seen an approach to it in ill-fed specimens of the former in my own trays. This underfeeding, or semi-starvation is well exemplified in some very Lilliputian specimens of *Actias Selene*, received from a gentleman who reared it at Serampore, near Calcutta, where he only supplied the worms with food *twice a day*; the moths are only a quarter of the natural size.
33. *Actias Selene*—Very common in a wild state at Mussoorie, where it feeds on the wild cherry, wild pear, walnut, cedrela paniculata, coriaria nipalensis, and several other forest trees and shrubs. It occurs also at Almorah, Darjeeling, Assam, Cachar, Saugor, and at Serampore, near Calcutta. Mr. C. Turnbull failed to reel silk from the cocoons sent down from this, but it has been reeled, though there is not much of it.
34. *Actias Manas*.—Doubleday—Occurs at Darjeeling and is a very large species, but nothing has been recorded of its habits, food, or produce.
35. *Actias Leto*—Is another Darjeeling species, the economy of which has yet to be ascertained.
36. *Saturnia pyretorum*—Occurs at Darjeeling and Cachar, but nothing more is known of it.
37. *Saturnia Grotei*.—Has been found at Darjeeling, and one or two specimens have been captured at Mussoorie, but collectors of moths make no inquiries as to economy, and for all practical purposes the species might as well remain unknown. I am inclined to think that the larva feeds on the wild pear tree (*Pyrus Kytul*?)
38. *Saturnia Lindia*—Moore.—Of this nothing more is known than that it occurred in a collection made by the late Captain James Lind Sherwill, and is supposed to be from Darjeeling or its neighbourhood. It is allied to *Saturnia Grotei*.
39. *Saturnia Cidosa*—Moore.—From Captain J. L. Sherwill's collection also, and from North-Eastern India, but we have no information regarding it. From its being closely allied to *Saturnia pyretorum*, I should be inclined to suppose it an inhabitant of Darjeeling or Cachar.
40. *Neoris Huttoni*—Moore.—Found by myself at Mussoorie at about 6,500 feet of elevation, feeding on the wild pear tree. The larvæ are to be found in April. The cocoon is an open net-work, and would produce no silk.
41. *Caligula Simla*—Occurs at Simla, Mussoorie, and in Kumaon, feeding on the walnut, salix Babylonica, wild pear tree, &c., but the cocoon is a mere coarse open net-work through which the pupa is visible, and yields no silk.

2. Amongst other papers received from various sources, Captain Hutton has forwarded a paper on the Indian and Asiatic species of the Bombycidae, to which it seems desirable to give early publicity.

3. Much, it is believed, may be done towards both increasing and improving the silk produce of India; but one of the first essentials to any successful action in these directions is complete information as to all that has yet been done, or attempted in India in this matter. A good deal of useful information has been gleaned from the records of the Government of India, and some few papers have been received from Local Governments and private individuals; but much more is, it is believed, available, which His Excellency the Governor General in Council is anxious to obtain, and in the collection of which he would invite the co-operation of the public generally and all Government officers.

ORDER.—Ordered, that this Resolution and Captain Hutton's Notes on the Indian Bombycidae, be published in the Supplement to the *Gazette of India*, and that the several Local Governments and Administrations, the public generally, and all Government officials, be invited to furnish the Government of India in the Department of Agriculture, Revenue, and Commerce, with any information (whether in print or in original manuscript) of which they may be in possession in regard to sericulture in India and the Indian silk trade, past and present.

Ordered also, that the thanks of the Government of India be conveyed to Captain Hutton for his monographic sketch of the Indian Bombycidae.

Ordered also, that a copy of this Resolution and of Captain Hutton's Notes on the Indian Bombycidae be forwarded to the Local Governments and Administrations noted in the margin; to the Chambers of Commerce, Madras, Bombay, and Bengal; to the Agricultural and Horticultural Societies of Madras, Bombay, Bengal, the Punjab, and Oudh, and to Captain Hutton.

Government of Madras.	Chief Commissioner of Oudh.
" " Bombay.	" " Central Provinces.
" " Bengal.	" " British Burmah.
" " N. W. Provinces.	" " Mysore and Coorg.
" " Punjab.	Resident at Hyderabad.

(True Extract,)

A. O. HUME,

Secretary to the Govt. of India.

Latest reports on the state of the weather and prospects of the harvest.

GENERALLY the prospects of the harvest throughout India, as far as reported, are not unfavorable.

In the Lower Provinces there have been floods in the Districts lying on the Ganges, Bhagiruttee and Matabangah, as also in Midnapore, and some Districts have suffered much injury. But, on the 31st August, the floods were reported to be everywhere subsiding, and, wherever there had been no flood, the crops were good and food cheap.

In a portion of the Bombay Presidency, and especially in Sholapore, the crops have suffered from drought. A loan of Rs. 10,000 has been authorised for the relief of the poorer classes in Sholapore. It is hoped that the heavy rain of the 29th ultimo may have a good effect.

The prospect in the Berars depends on the continuance of the rain-fall. Reports at short intervals have been called for. In other Provinces there is no cause for present anxiety, though a prolonged cessation of rain would undoubtedly be dangerous.

The following statement exhibits in detail the latest accounts received.

P. S.—The prospects in Sholapore by the latest report appended to the table are brightening.

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	RAIN-FALL FOR WEEK.		Date of despatch from Local Government or Administration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR ADMINISTRATION.
				Week ending	Inches.			
1	BERAR	East Berar { Ellichpore ... Woon ... Omrawuttee ... Akola ...	August 30	...	...	August 30	Cotton crops safe as yet, grain crops on high grounds commenced to wither; but heavy rain now falling; seems likely to continue. If so, all will be well.	
				...	0.1	"	Prospects of season worse than previously reported. Nothing but a good and immediate fall of rain can save even a portion of the autumn crops, while sowings for the rubbee will be impossible. There is no water in the streams, and no fodder left for the cattle in the plains.	
				...	0.14	"	Harvest prospects brighter than last reported, but a continuance necessary to do permanent good	* Rain-fall on the 30th only.
				...	0.23	"	Crop prospects threatened by want of rain, but now improved.	Recent rain will, it is hoped, rescue crops which were everywhere suffering from unusual intermission of rain.
		West Berar { Ditto	31	...	1.4	"	Rice and coffee crops affected injuriously by break in monsoons.	
2	MYSORE	Bangalore	29	...	2	"	Good.	
		Mysore	"	...	.92	"	Favorable.	
		Coorg	28	...	3.5	"	Good.	
		Indore Gwalior Rutlam West Malwa Sutina	30	...	.4 9.1 .83	31	Weather continues favorable for crops.	Cattle disease prevalent at Sohawal. + Heavy.
3	CENTRAL INDIA	Baghelkand	"	...	+	"		

No.	PRESIDENCY OR PROVINCE.	District.	Date of District Report.	Rain-fall for fortnight preceding.	RAIN-FALL FOR WEEK.		Date of despatch from Local Gov- ernment or Ad- ministration.	State of Agricultural Prospects.	REMARKS BY LOCAL GOVERNMENT OR AD- MINISTRATION.
					Week ending	Inches.			
4 PUNJAB*		Delhi	August 30 ...	5.9		..	August 31 ...	Crops flourishing.	* Rain much wanted throughout the greater part of the Province at this critical season, but harvest prospects are good in Delhi and Umballa Divisions, and in submontane Districts generally.
		Jullundur	" "	0.5	.....	..	" "	Crops on unirrigated lands want rain.	
		Lahore	" "	Nil	.....	..	" "	Crops on unirrigated land lost for want of rain. Bari Doab Canal now flowing, but supply small and irregular. Much loss was caused by its stoppage.	
		Multan	" "	Nil	.....	..	" "	Crops generally good, but have suffered somewhat from river inundation in Tahsil Mylai, Lodhron, Shujabad, and Serai Sidhoo. On unirrigated lands in Serai Sidhoo crops are not as good as usual for want of rain.	
		Rawul Pindae	" "	Nil	.....	..	" "	Indigo crops have suffered slightly from want of canal water.	
		Peshawur	" "	Nil	.....	..	" "	Crops still good, but rain wanted.	
		Raipur	" "	1.13	.....	..	August 31 ...	Crops good.	
		Jalalpur	" "	1.87	.....	..	" "	Crops doing well, but rice on high lands suffering from long break. In Be-lasapur and Sambalpur more rain has fallen. Rice crops promising well; cotton somewhat injured by rain.	
			" "		.....	..	" "	Present prospects good, but more rain now wanted. Rice prospects in Dandla and Seoni good. In Mandla more rain wanted. Jawar and cotton suffered from rain in Damoh and Seoni, but are recovering in Seoni.	
			" "			..	" "		

No.	Province	City	Date	Barometer	Thermometer	Wind	Clouds	Remarks
5	CENTRAL PROVINCES	Nagpur	...	...	...	...	...	Prospects decidedly favorable in Nagpur, Bhandara, and Balaghat. Good in Wardah, but rain wanted.
6	...	Hoshangabad	...	...	...	...	...	Prospects at Hoshangabad and Nursing-pur good. Cotton and jawar on low land somewhat injured. Fair weather doing good at Hurda. Rain much required. In Nimar rain much needed. Rice crops nearly failed, and other crops wanted rain. Nimar prospects gloomy. Betul estimated yield of crops three-fourths of average. Good.
7	N. W. PROVINCES	Benares	...	...	...	...	...	Rice crop better for sun; ploughing begun. Crops benefited by sun. Crops fair. Crops average. Favorable. Mash sowings stopped by heavy rains. Rice, kodo, jawar ripening. Unfavorable.
8	ODISHA	Serohie	...	...	...	...	...	Prospects very good if rain falls soon. Prospects good. Prospects fair; dry weather required. Prospects satisfactory; sowing recommended. Prospects favorable. Prospects good; break required. Prospects promising. Very good; harvesting. Very good; harvesting. Fair. Good. Very bad. Generally good. Crops withering, and sowing operations retarded.
9	RAJPOOTANA	Jeypore	...	...	...	...	...	Rain scanty. The amount of rain-fall on the 29th is 2.41. This will save many crops.
10	BOMBAY	Dharwar	...	...	...	...	...	

BENGAL.—*Date of report, 31st August.*—There have been floods along the Railway in the Patna District. The waters are subsiding, and there has not been much loss. In the rest of the Patna Division there have been occasional floods, but not much harm has been done. The crop prospects are good.

The Monghyr and Bhaugulpore floods have been local but heavy, and have done considerable damage.

There were heavy floods in part of Purneah. The last report says they were subsiding after some destruction of crops.

There have been no recent reports from the Rajshahye Division, except Moorshedabad, where there have been heavy and extensive floods from the Bhagiruttee. The embankments have been burst and part of Moorshedabad City inundated. There is some distress, and relief is being given.

Very extensive and continued floods in Nuddea from the Matabangah, and a large area of country is under water. The Eastern Bengal Railway has broken in two or more places. The water was last night (the 30th) over the rail level for two or three miles. Many of the District roads are under water.

An embankment of the Cossye has burst in Midnapore and caused floods. In one or two Districts the damage done is great, but, wherever there is no absolute flood, the crops are good and food is cheap. The latest accounts show that the floods have begun to subside everywhere.

BOMBAY.—*Date of report, 1st September.*—In the Sholapore Collectorate about 1 inch and 73 cents. have fallen within the last three days, and more is threatening. The prospects, hitherto appalling, are now brightening. The price of Jowaree is still at six seers per rupee. Many workmen are being employed.

No. 34

of 1871.



SUPPLEMENT TO
The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 9, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT to the GAZETTE OF INDIA will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA is required by Law, of which it has been customary to publish in the CALCUTTA GAZETTE, will be included in the SUPPLEMENT. For such Orders and Notifications the body of the GAZETTE must be looked to.

GOVERNMENT OF INDIA.

LEGISLATIVE DEPARTMENT.

Abstract of the Proceedings of the Council of the Governor General of India, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 & 25 Vic., Cap. 67.

The Council met at Simla on Tuesday, the 29th August 1871.

P R E S E N T :

His Excellency the Viceroy and Governor General of India, K. P.,
G. M. S. I., *presiding*.

His Excellency the Commander-in-Chief, G. C. B., G. C. S. I.

The Hon'ble John Strachey.

The Hon'ble Sir Richard Temple, K. C. S. I.

The Hon'ble J. Fitzjames Stephen, Q. C.

The Hon'ble B. H. Ellis.

Major-General the Hon'ble H. W. Norman, C. B.

The Hon'ble F. R. Cockerell.

The Hon'ble R. E. Egerton.

CRIMINAL TRIBES BILL.

The Hon'ble MR. STEPHEN asked leave to postpone his motion that the Report of the Select Committee on the Bill for the Registration of Criminal Tribes and Eunuchs be taken into consideration.

Leave was granted.

LOCAL PUBLIC WORKS LOAN BILL.

The Hon'ble MR. STRACHEY presented the Report of the Select Committee on the Bill to facilitate the construction of works of public utility from Local and Municipal Funds.

RAILWAY BILL.

The Hon'ble MR. COCKERELL presented the Report of the Select Committee on the Bill to amend the Railway Act.

LOCAL EXTENT ACTS BILL.

The Hon'ble MR. COCKERELL also introduced the Bill for declaring the local extent of certain Acts passed by the Imperial Legislative Council, and moved that it be referred to a Select Committee with instructions to report in six weeks. He said that, of the ninety-three Acts specified in the schedule, eighty-eight were divisible into the two classes which he described when asking for leave to introduce this Bill,—(1st) Acts which having been enacted previous to 1856—the last year in which any considerable addition was made to the British dominions in India—were never formally extended to the whole of the territories which now constitute 'British India;' and, (2nd), Acts which though intended for general application had no express self-contained definition of their local extent.

In the case of the first of these classes, the Bill was designed to operate as an extending, and in regard to the second, as a mere declaratory, Act. In neither case did it vary the operation of any Act within those territories which had a separate local legislature.

The Bill was not, therefore, as he pointed out on a former occasion, impugnable, on the ground that it would have the effect of narrowing the power now possessed by the several local Councils, of amending or repealing enactments of a date previous to the passing of the Indian Councils' Act of 1861.

The remaining five Acts contained in the schedule constituted the two great Procedure Codes—Civil and Criminal. When enacted, they were made extendible, but were not then extended, to the whole of British India. They have since by various executive orders been gradually extended to all parts of the empire, except the territories referred to in the second section of the Bill. They have consequently been included in the schedule for the purpose of consolidation.

It would be a question for the consideration of the Select Committee to which this Bill might be referred, whether its object might not be attained without the specification of the several Acts contained in the schedule. On the one hand, such detailed specification had its obvious disadvantages, whilst, on the other, by any mere general reference to the Acts to which the Bill related, we ran the risk of failing to get rid of that ambiguity in regard to the intended operation of particular Acts, which this Bill was expressly designed to remove.

The Hon'ble MR. STEPHEN said that the present Bill formed part of the general scheme of simplification of the law with which the Council had been of late so much occupied. No one without actual experience would believe how difficult a task at present it was to ascertain what the law in different parts of the country actually was. First, there was the distinction of Regulation and Non-Regulation Provinces, then there were Non-Regulation Districts in Regulation Provinces; then, again, there were Acts which were of limited application, and there were four distinct legislatures besides the Imperial Parliament, all of which were constantly adding to the existing body of law.

It was, therefore, of the utmost importance that the area to which these various enactments were applicable, should be precisely ascertained. Nothing would be added to the bulk of the existing law; the only object was to let it be clearly known what laws were in force in each part of India. When his hon'ble friend, Mr. Cockerell, to whose labours in this difficult and intricate matter the Council and the public were much indebted, had succeeded in passing the present and one other analogous measure which was now under consideration in Committee, the whole subject would be reduced to absolute simplicity. The various districts which at different times were specially legislated for, or specially excepted, would all be clearly ascertained, and great assistance would, he (MR. STEPHEN) hoped, be given to the regular and speedy administration of the law.

The Motion was put and agreed to.

CIVIL COURTS (OUDH) BILL.

The Hon'ble MR. COCKERELL also moved that the Hon'ble Mr. Ellis be added to the Select Committee on the Bill to consolidate and amend the law relating to the Civil Courts in Oudh.

The Motion was put and agreed to.

The following Select Committee was named :

On the Bill for declaring the local extent of certain Acts passed by the Imperial Legislative Council—The Hon'ble Messrs. Stephen and Egerton and the Mover.

The Council adjourned to Tuesday, the 5th September 1871.

H. S. CUNNINGHAM,

SIMLA;
The 29th August 1871. }

*Offg. Secy. to the Council of the Governor
General for making Laws and Regulations.*

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Forest Conservancy in Raneekhet.

From MAJOR J. BONUS, E. E., Assistant Secretary to the Government of the North-Western Provinces, Public Works Department, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 103F—C, dated Nynce Tal, the 24th July 1871.

IN continuation of former letters on the subject of the cantonment at

1. Report on Forest Conservancy, &c., at Raneekhet, by Dr. King, Officiating Deputy Conservator.
2. Report on the Fruit, Timber, and Fuel Plantations of Raneekhet, by Dr. King and Mr. Craw.
3. Officiating Conservator's letter submitting the latter report.

Raneekhet, I am directed to forward, for the consideration of the Governor General in Council, the accompanying copies of reports* by Dr. King, dated the 15th June and 25th May, together with a copy of the Conservator's letter dated 4th July, covering the latter.

2. First as to the report of the 15th June, I am directed to say that this is, in His Honor's opinion, a valuable and exhaustive paper on the subjects

treated, and His Honor commends Dr. King's labours to the favourable notice of the Governor General in Council. The report is all the more creditable to Dr. King, inasmuch as it was made after his nomination by Her Majesty's Government to the superintendentship of the Calcutta Botanical Gardens; it is evidence therefore of the zealous interest taken by him in his former charge.

3. The description of the physical characteristics of the Raneekhet Hill, destined to be so important a station, is clear and interesting.

Opinions vary as to the effect of the local forest and coppage on the springs adjoining. The Lieutenant-Governor is disposed to attach weight to the views of Dr. King (given in paras. 4 and 5 of the report) as to their direct effect in enhancing the water-supply. But even leaving this service out of view, the advantages from the shade and comfort of the foliage at present existing are objects of great importance, and justify extreme care in preserving the existing timber as well as in endeavouring to promote the growth of umbrageous trees wherever the land is at present bare.

4. The correctness of the position laid down by Dr. King in his 6th para., that in forests the preservation of which is desired nothing beyond the annual increase should be removed, is undoubted. It appears to His Honor that this increase within the cantonment and its environs must be very limited, and, with reference to what has been already removed, there should, for the present at least, be an entire prohibition of cutting save in the most exceptional cases noticed in Dr. King's 8th para., and even then only with the sanction of the local Conservator.

5. The necessities of Raneekhet are two-fold,—for building and for fuel.

First, as regards building timber. It is much to be regretted that the forests in the neighbourhood of Raneekhet have suffered so much by the wasteful cutting and burning of the villagers as is witnessed by Dr. King in para. 8. It seems to the Lieutenant-Governor that a local European Conservator, with a sufficient establishment, is essentially required; that the forests should be absolutely under his control, and that he should be armed with the necessary magisterial and police powers to prevent and punish any such depredations for the future. His jurisdiction should extend over a range having a radius of 12 miles from the Kompoor Hill, and no trees should be cut either for building or any other purpose, whether by the people or for the public service, but as indicated by him. A notification will be issued declaring the area above-mentioned, subject to the forest laws.

The Seonee forests are correctly noted by Dr. King as the natural source of supply for Raneekhet, and should be most carefully conserved for this purpose.

6. *Secondly*, with respect to fuel. Hitherto the refuse of trees felled for the Department Public Works, dead wood, &c., have sufficed for the wants of the station. Of the three local sources indicated in Dr. King's 9th para., *viz.*,

- (1) refuse of timber used by Department Public Works,
- (2) dead trees unfit for building,
- (3) stocks of trees cut down,

the third is still considerable. The Commissariat Department has been authorized to use the wood referred to. But Dr. King is of opinion that it will not meet the wants of the cantonment for more than a year or two to come. The Lieutenant-Governor agrees with him that operations for providing a local supply by planting should be vigorously prosecuted; and until a sufficient growth is thus obtained, that fuel should be taken from the forests at a fair distance from the cantonment under careful supervision by the local Conservator.

7. In the recommendation repeated in para. 10, for the absolute prohibition of felling on the Raneekhet Hill, the Lieutenant-Governor has already expressed entire concurrence, and His Honor may add that he also concurs with Dr. King as to the advantage both in respect of shade and grass of evergreen species over the Cheer, and the consequent gain of encouraging the growth of the former even if it be at the expense of the latter. It is assumed that the Cheer is intolerant of evergreens and drives them away; it is accordingly proposed, when the two species interoscute, that the Cheer should be cut out so as to allow the Oaks to flourish and spread. The experiment may be tried, but, in the Lieutenant-Governor's views, very cautiously. It is Colonel Ramsay's experience that where the Cheer alone prevails, it is because the soil is inimical to other species; and we must not, in the hope of superseding the Cheer by other species, run the risk of entirely baring any part of the range. Experiments in planting bare spots with Deodar, Oak, and Australian trees, should however be tried everywhere.

8. Para. 11. Colonel Chamberlain will give vigorous aid to all the operations here contemplated; and it will be well that as regards the cantonment, the forest officers should work in all matters of repression and penalty through the Cantonment Magistrate to avoid any cause for offence or collision.

9. The measure suggested for protecting and fostering natural reproduction, especially in the Seonee range, should have the earliest attention of the local Conservator.

10. The remainder of the report is occupied with proposals regarding the nursery and plantation lands and for establishments.

11. With the former subject the letter of the 25th May (unfortunately delayed in the Conservator's Office) also deals. The site proposed contains about 45 acres, and has been carefully selected (in communication with Captain Birney, Executive Engineer) as to soil and situation, so as not to encroach on any building sites. In the Lieutenant-Governor's opinion it is not too large for the projected operations. It will be ascertained, before work is commenced, that no objections can be raised to the occupation of any part of it for the objects proposed. But even if the ground should be required hereafter for other purposes, it would be easy to resume it.

12. As the season presses, and it is of essential consequence that the young fruit trees be at once planted out, His Honor has, in anticipation of His Excellency in Council's sanction, given permission for the immediate occupation of the land by Mr. Craw for the purpose, and also for the growth of forest seedlings adapted as well for fuel as for building operations. The suggestions in paragraphs 13 and 14 of the report as to the kinds of woods to be encouraged, will no doubt be found very valuable in carrying out this design.

13. In respect of supervision, it is quite impossible that the interests of the cantonment, the surrounding forests, and the nurseries, can be properly secured without the constant attendance of an experienced and well-qualified Conservator. Mr. Craw is the person who possesses the necessary qualifications in the highest degree, and is recommended as such by Dr. King. His services, it will be remembered, are at present secured, but only partially and occasionally, for the nurseries at a remuneration of Rs. 150 per mensem. The Lieutenant-Governor is not aware whether his permanent engagements on his own factory would admit of his taking the appointment; but with the permission of His Excellency in Council, it may be ascertained if he is prepared to do so, and on what terms.

14. The other establishment proposed by Dr. King is also recommended; it would be entertained at the first only experimentally, and would be kept at as low a point as is consistent with efficiency.

15. His Honor the Lieutenant-Governor is persuaded that the necessity for these proposals will commend itself to the Governor General in Council. The future of Raneekhet requires that immediate and energetic measures be adopted for conserving the forests and for establishing plantations and nurseries with the object of providing a plentiful supply of fuel and timber, and also with the view of promoting the growth of useful fruit trees. The expenditure proposed will not appear large when the magnitude and importance of these objects is borne in mind.

16. As these operations are undertaken solely in the interest of the Raneekhet cantonment, the cost will of course be debited to the imperial revenue; the object, moreover, is but little connected with the Forest Branch excepting in the aid its officers are qualified to give. But it is immaterial whether the cost is debited to the military or civil side of the imperial accounts.

Report on Forest Conservancy, &c., for Raneekhet, by G. KING, ESQ., M. B., Officiating Deputy Conservator of Forests, Kumaon,—dated 15th June 1871.

CONTENTS.

Para. 1. Physical characters.	Para. 9. Sources of fuel supply.
" 2. Geological formation.	" 10. Felling on Raneekhet Hill.
" 3. Soil.	" 11. General scheme for conservancy.
" 4. Water-supply.	" 12. Nurseries.
" 5. Character of the natural vegetation.	" 13. Kinds of seeds to be sown.
" 6. Natural reproduction of the forest.	" 14. Plantations.
" 7. Demands upon the Raneekhet forest.	" 15. Establishment.
" 8. Sources of supply of building timber.	" 16. Revenue.

1. *Physical characters.*—The area embraced within the Trigonometrical Survey Map of Raneekhet consists of a comparatively level sketch of hill broken up to some extent by ridges and ravines, but much less precipitous in character than the stations of Nynsee Tal and Mussoorie. Towards the south and west, the sides of the hill are steep, while northwards and eastwards they slope down gently into the wide valleys of the tributaries of the Kosee River. In physical character, Raneekhet much more resembles Almorah than either of the stations just mentioned, and like Almorah, it is separated from the plains by an outer and higher range of hills. Chiefly, on account of the greatest force of the monsoon spending itself upon this outer range, the rain-fall at Raneekhet is much more moderate, and the natural vegetation much more stunted and scanty than that of the outer or Nynsee Tal range.

2. *Geological formation.*—The prevailing rock is a very friable mica schist. Here and there are however interspersed metamorphic strata of harder texture, with occasionally a tendency to slaty fracture. Lime is absent, or nearly so. As a whole, the Raneekhet Hill may be looked upon as a mass of micaceous rock, in which valleys have been worn by the action of the natural drainage.

3. *Soil.*—The soil consists of disintegrated micaceous rock as a basis. On most of the ridges, and on exposed and bare places, this is indeed its only constituent. In other parts where vegetation has been, and now is, dense, and at the bottoms of valleys generally, there is a layer of fine brown loam formed of decayed vegetable matter, and in many cases from 10 to 15 feet in thickness. The present cantonment, the elevation of which is about 6,000 feet above the sea level, lies on a north-eastern slope, and covers ground of which the soil is of the former poverty-stricken description. Oaklands and the higher grounds intended for the civil station, and for the extension of the cantonment, possess, on the other hand, much of the rich loamy soil. But taking the hill as a whole, the poor soil greatly preponderates. The prevailing lightness of the soil, and the porosity of the under-lying rock, render the natural drainage extremely good. Immediately after the heaviest shower, the roads within the station, the pathways in the forest, and even the ploughed fields of the villagers, look as dry as if they had not been rained upon for hours.

4. *Water-supply.*—There is scarcely one of the numerous ravines by which the hill is furrowed that does not possess its spring of water. These springs are, however, very small indeed; all of them become greatly diminished during the hot weather, while many entirely disappear. Such springs are dependent for their existence on the conservative effect of trees on the moisture of the soil, the roots of which also act as conductors downward of the rain water. Extensive clearings of timber, especially on the higher grounds must, I am sure, sooner or later endanger them.

With one or two exceptions, there is no large spring and no large stream of water on the entire surface of the hill. This is quite what might have been expected from its geological structure, and the station may be characterised as essentially a dry one.

5. *Character of the natural vegetation.*—This cannot be called luxuriant. As a rule, the ridges and higher grounds are covered with a sparse forest of rather poor Cheer (*Pinus Longifolia*) and the bottoms of the valleys with Oak (*Quercus incana*), Rhododendron (*R. Arboreum*) and a variety of shrubs and small trees. The ridges however on the very summit, as at Oaklands and Chanbattia, are exceptional, for they are clothed with oak and Rhododendron to the exclusion of Cheer. There is the closest possible connection between the character of the soil and the forest that covers it. Oak is only found naturally abundant where the soil is good and composed of vegetable loam. Cheer, on the contrary, is rarely found in such localities, but occurs plentifully where the soil is dry, porous, and poor. The ridges at Oaklands and along the summit having, unlike these on other parts of the hill, a good soil, give support to Oak. The relations of the natural vegetation to physical conditions at Raneekhet are so striking, and the plans for future forest conservancy must (to be successful) be moulded so much upon them that even at the risk of being tedious, I shall here refer to them more fully. Oak forest grows on good rich soil and is found wherever that abounds, which is usually in the bottoms of valleys. Under the trees there is fresh good grass, and numerous shrubs. The forest is shady, damp, and cool. Cheer forest is found on poor light soil, and usually covers all ridges. This tree yields a very light shade, and the forest is dry and hot. Almost the only under-growth is a scanty crop of wiry grass, and there are very few bushes. In fact hardly anything will grow under the shade of Cheer, not even young trees of its own species. The soil is, therefore, comparatively bare and unprotected from the rays of the sun, which bake it to a great depth; the heat collected by the soil during the day being parted with by radiation during the night. It would be, I believe, impossible to settle in how far these differing conditions of soil, temperature, and surface moisture are the cause, and in how far they are the effect of the difference in the character of the forest with which they are associated. There is unmistakeably a reciprocal action. But there is little doubt that the deep vegetable loam of an Oak forest is the product of the decay of the leaves of oak trees that it has formerly supported, and is now supporting; and it is perfectly certain that were the Oaks now cut down, and the shade of their evergreen leaves removed, the rays of the sun would, by beating on the soil, soon affect its moisture and temperature. It is also true that the leaves shed by the Cheer, apart from their liability to be burnt, are too scanty to afford much soil by their decay; and that the poverty of the soil covered by Cheer forest is to some extent assuredly due to this fact. If the two species be left to themselves, Cheer will undoubtedly always beat Oak on poor and dry soil, and finally drive it out. Oak however will grow on barren and dry places if protected from Cheer, as can be seen in many places within the cantonment, and especially along the lines near the bottoms of the valleys where the two trees naturally meet.

In many such situations Cheer was cut down for building purposes a year or two ago, and in consequence of its removal, young oak is springing up vigorously, and old Oak stumps that had been closely cropped by the villagers for cattle fodder are pushing young branches. Oak growing in such barren spots will by the shade it affords, and by the decay of its fallen leaves, in due time effectually fertilize the soil. Without protection from Cheer however, Oak would in such situations become stunted and even get exterminated. Were Oak substituted for Cheer in the cantonment of Raneekhet, and a thick covering of evergreen leaves thus interposed between the sun and the soil, I feel quite certain that the character of the latter, and of the grass born upon it, would be improved, the temperature of the station diminished, and the water supply increased and rendered less precarious.

6. *Natural reproduction of the forest.*—By this I mean the modes by which trees removed by death and other causes, such as felling, are naturally replaced. Trees may be replaced either by new plants springing up from seed, or by young shoots springing up from the stumps of felled ones. This latter mode is known as *coppicing*. One essential to very vigorous natural reproduction in either of these ways, viz., *abundance of moisture*, is, as has been already said, wanting in Raneekhet. Moreover, Cheer does not coppice at all, and Oak and Rhododendron do so only to a limited extent. Except on Oaklands and Chanbattia and in a few of the larger valleys, there is really no very dense or luxuriant forest of these latter trees. The amount of coppice or of naturally sown seedlings in these forests, could

therefore be at best but limited. The Cheer forest, with the exception of that covering one or two slopes below Mr. Troup's middle and upper tea plantation, is everywhere so sparse, and affords so little shade, that the soil is baked and hardened to a degree that must make the germination of self-sown seed very difficult. The number of young Cheer trees is not great; and they are always most vigorous in spots which, though near the forest, are clear of trees. In such situations, probably from the protection afforded to the seedlings by the longer grass, and from the better soil resulting from the free growth of grass, they have a better chance. Whatever, however, may be the natural productivity of any forest, no greater amount of timber can without injury be taken from it annually than it is capable of producing in the course of a year. In other words, nothing in excess of its annual natural increase ought to be taken from any forest which it is desired to retain as a forest. This annual increase need not necessarily be removed every year, but may be allowed to accumulate; just as interest on bonds need not be drawn every quarter day, but, if preferred, at the end of certain fixed periods.

7. *Demands upon the Raneekhet forest.*—In addition to many trees cut down by Mr. Troup to clear ground for tea, before the sale of his property to Government, there has been already taken from a forest, by no means extensive or luxuriant, a large quantity of timber for the building of barracks and dwelling houses, besides fuel for the detachment of troops, and for private consumption. The detachment has just been increased to half a regiment, and although I have no official information on the subject, I am led to believe that it is intended that one or two entire European regiments with their women and children, and possibly the office establishments of several (if not all) of the Departments of the Government of India, shall be ultimately stationed at Raneekhet. If such be the case, the erection of more barracks, of a number of dwelling houses, and of a large Native bazaar, will of course become necessary, and timber will have to be provided for these purposes. A proportionate supply of firewood will also be required for such a largely increased population. To give some idea of the amount of fuel that will be required, I may mention that the half regiment of Europeans presently stationed at Raneekhet is being supplied at the rate of about 60,000 maunds per annum. The supply appears to me to be very great, and if two regiments are to be treated on equally liberal terms, all the wood existing in Raneekhet at present will be exhausted.

According to the statistics kindly sent to me by Mr. Ribbentrop, Deputy Conservator of Forests in charge of the Punjab fuel plantations, the consumption of fuel in a hill station is estimated at 2,262 pounds per annum for each European soldier, and $1\frac{1}{2}$ maunds a day for every private dwelling house.

8. *Sources of supply of building timber.*—The building timber used in Raneekhet is almost exclusively Cheer. For the erection of barracks and bazaar, supplies of this timber have hitherto been got by felling the larger trees on the hill, and chiefly within the cantonment limits. A good many young and growing trees have, however, been cut for minor purposes. This is much to be regretted, as unless crooked or otherwise damaged, growing trees should never be cut. There still remain within cantonments a few mature trees which might advantageously be felled; and in the piece of ground which it has been proposed to add to the cantonment, as also on the estate just acquired from Mr. Troup, there are a good many mature trees. All such might be cut with advantage. They will, however, be insufficient for any great amount of building such as is likely to take place. With a view to the supply of building timber for the station, I have examined the forests within a radius of twelve miles from the cantonment. These are everywhere interspersed with villages, the inhabitants of which have by usage acquired a kind of right to cut timber within them for village use, *but for village use only*. Until recently, no supervision whatever was extended to these forests, and the villagers have got into the habit of hewing and hacking and burning in the most ruthless and wanton way, destroying an immense deal more timber than they use. All over these forests fine Cheer logs may be seen rotting, large trees having been originally felled to supply some small domestic demand for timber, which having been met, the remainder was left to decay. Only recently was an establishment of five (5) patrols (Natives) put on by the Forest Department for the protection of these now valuable outlying forests; and since the appointment of these patrols, villagers have been ordered to send requisitions (for such timber as they may require) to the Kumaon Forest Officer, without whose sanction they are directed to cut nothing. Old habits are however not so easily changed, and the villagers do not like the trouble of applying for what they want. The authority of the patrol establishment is frequently set at naught, and trees are cut in defiance of their remonstrances. When they do condescend to send requisitions, the villagers usually ask for many more trees than are necessary, forty trees to build one small house being a common request. I fear they sell most of the timber they cut, and that they have no right whatever to do; the only wood ever allowed gratis being for *bond fide* village use. More efficient European supervision of the forests is wanted, and also a larger Native establishment. The European in charge of the nurseries and plantations at Raneekhet might be put in charge of these forests also, and no grant of trees should be given to any villager without his personally enquiring into the necessity for the grant, and himself marking any trees that he may decide to give. The forests within the radius

indicated consist, like those of Raneekhet, of Cheer and Oak. With the exception of the forest on the Seonee hill, 10 miles north-west of Raneekhet, and of that on a few of the spurs near it, they are comparatively poor and sparse, consisting of thin stunted trees on bad soil. Here and there are patches of heavy Cheer, suitable for building, but such patches are scattered. Seonee however is really a forest from which much building timber might be taken. It is only 10 miles from the station, and the newly made road to Ramnugger and the plain runs quite close to it. This is by far the best source from which supplies of building Cheer can be drawn, and it should in my opinion be regarded as the natural forest of Raneekhet and conserved accordingly.

9. *Sources of fuel supply.*—Up to the present time all the fuel used in Raneekhet by both troops and private parties has been derived from (1) the dead Cheer wood laying about the forest upon the hills, both inside and outside cantonments, and (2) from the refuse of Cheer trees felled by the Public Works Department for the erection of barracks, &c. All the supplies have been drawn hitherto from the Raneekhet hill, and none from any of those near it. Cheer has been the wood hitherto used, but this makes bad fuel. Being light, soft and resinous, it burns too rapidly; it yields moreover charcoal of very bad quality. Oak and hard non-resinous wood in general make the best and most economical fire-wood. While Cheer is to be regarded as the natural *building timber* of the station, other kinds of trees must be looked to for supplies of fire-wood, and of these naturally occurring in the forests, Oak, Rhododendron and Alder are the chief. The Oaks, however, at present in the Raneekhet forests are too few, and for other reasons, too valuable to be cut for fuel. In fact, the only fuel that can without injury be taken for some years to come from the forest on the hill consists of—

- (1) branches and refuse of such mature trees as may be felled for building purposes;
- (2) any dead trees that may still remain within the forests, the wood of which is unfit for building,—such trees are but few in number;
- (3) all the stumps and roots of trees that have been cut,—from this source a considerable supply may be derived, and I have recommended that the Commissariat Department be allowed to remove these to meet present demands.

The supply obtainable from these sources cannot do more than meet the wants of a year or two. It is therefore imperative that immediate steps be taken to begin fuel plantations upon the hill, and that after the three sources just indicated have been exhausted, and until the plantations be ready to yield, supplies be drawn from the neighbouring forests under proper arrangement and supervision.

10. *Felling on Raneekhet Hill.*—I cannot express in too strong terms my conviction that felling operations upon Raneekhet Hill have already nearly reached their legitimate limits, and that if it is desirable to keep the hill covered with trees, further cutting ought to be most carefully conducted. In my opinion, only the mature trees (that is, such trees as have attained their full growth) ought to be cut; no half-grown or young trees ought on any account to be felled, except those to be subsequently indicated. All mature trees intended for felling ought to be marked, and on account of their influence on the water-supply none ought to be so marked that stand on the top of ridges, at the heads of ravines, or near the sources of springs. As soon as all the selected mature trees have been removed, the forests ought, as regards cutting, to be absolutely and entirely closed, and illicit felling ought to be visited with severe penalties. All *dead and dying* Oak, Rhododendron, and other like trees, and all stumps might be removed for fuel; but after their removal every kind of ever-green tree on the hill should be preserved as rigorously as Cheer. These measures I recommend on sanitary grounds as well as matters of forest conservancy. The natural reproductive powers of the forests are so limited that a year or two more of indiscriminate cutting of timber for building and fuel would reduce these forests to a condition that would be but the beginning of their complete destruction. The station of Almorah affords an excellent example of the hideous barrenness that results from indiscriminate and excessive felling in a naturally sparse forest on poor soil, while Nynee Tal is an equally good illustration of the effect of judicious conservancy. I feel quite sure that the water-supply of Raneekhet will not continue equal to the wants of the present force stationed there, and far less to those of two regiments, unless the natural timber covering the soil be preserved and even increased. If the hill be cleared of many more trees, the springs will, I believe, disappear, and the temperature of the station will be heightened. With a view of increasing the shade and water-supply, and of reducing the temperature, I would suggest that within cantonments the growth of ever-green trees, and especially of Oak, be encouraged by every means. For this end I would suggest that wherever Oak and Cheer grow together, or near each other, the latter, even though young, should be cut out, so as to allow the Oak to come up. Young trees thus felled would come into use for building the Native bazaar, as small round timber is the very thing wanted for that purpose. Not the least valuable result of exchanging Cheer for Oak forest would be, as was

pointed out to me by Colonel Chamberlain, Cantonment Magistrate, the increased supply of grass, an extremely important consideration in a large station, whereas in Raneekhet food for horses is both hard and scarce. I would also suggest that every bare spot should be planted with trees yielding fuel or building timber, *and shade as well*,—such as Deodar, Oak, Australian gum trees and acacias.

11. *General scheme for conservancy.*—The forest within cantonment limits is at present under the charge of the Cantonment Magistrate, and I think the arrangement might with advantage be continued. Colonel Chamberlain's enthusiasm and great practical knowledge of gardening would be most valuable in carrying out plantation schemes within cantonments, and he could be supplied with seedlings from the forest nurseries. The forest on the piece of ground proposed to be added to the cantonment, as well as that upon the land just acquired from Mr. Troup, are at present under the charge of the Executive Engineer, who cuts in them such trees as may be required for the Public Works Department. If a Forest Officer be appointed in connection with the nurseries and plantations, it might be better to make these forests over to him, as he would have more leisure to look after them than the already overburdened Executive Engineer. In the meantime, the present Executive Engineer is responsible that none but mature trees in proper sites are marked for felling. The Forest Department has at present no charge of any forests on Raneekhet hill itself, but only of those outside the hill and within the 12 miles radius. But these latter have not as yet been regularly taken up and gazetted as forests. This ought to be done as soon as possible, and they should be put regularly under the Forest Department, so that no villager may have power to fell timber for any purpose without sanction of the Forest Officer, who ought to mark all trees given to villagers. These people invariably want to get small trees for their buildings, because the expense of sawing into small scantlings is thereby saved. As a rule, full-grown trees alone should be given to them, and saplings only where it is for the advantage of the forest that such be thinned out. The selection of trees to be given to villagers or even to the Public Works Department ought never to be left to an uneducated Native. A Forest Officer who has some idea of the work should invariably decide upon each tree that is to be marked for felling. Villagers ought to be directed to send in their requisitions at certain fixed dates, once a year or oftener, so as to prevent the necessity for endless inspections by the Forest Officer.

Natural re-production by seed should be encouraged in the following ways:

- (1).—By the closure of the forests to cattle. The injury done by grazing is not to be measured merely by the ravages of the cattle themselves (and these are not inconsiderable, for a buffalo is quite capable of eating down in a few hours a good many hundred seedlings), but also by the injuries done to the larger trees from the number of branches lopped off by the herdsmen for their cattle,—only a few of the leaves of these branches being eaten, the rest are trampled down and wasted.
- (2).—By protecting the forests entirely from fire, a most difficult matter, and only to be effected by strong measures.
- (3).—By prohibiting any one from cutting a twig or even from entering the forest carrying an axe.

These measures, and specially the first, could probably be fully enforced only on Raneekhet hill, and on certain selected spots beyond it, such as Seonee. I would strongly recommend their immediate adoption in the Seonee forest.

12. *Nurseries.*—These are required for the extension of timber, fuel and fruit trees. But until it is known what population will have to be provided with fuel and building timber, it is of course impossible to go into exact details (especially in reference to fuel) as to the area that will require to be planted out. But the present uncertainty on this point need not interfere with the immediate preparations of nurseries, as it costs very little less to prepare these for plantations to cover a hundred acres than for double that number. And even, although the station of Raneekhet were not to extend beyond its present dimensions, plantations

No. 92, dated 25th May 1871, Kumaon Forest Office.

From Dr. G. King, Officiating Deputy Conservator of Forests, North-Western Provinces, and Mr. Craw, to Conservator. *Subject.*—Site for Orchard Nursery.

would be necessary to provide for the future. In the separate communication marginally noted, submitted in conjunction with Mr. Craw, I have recommended a site for an orchard and tree-nursery extending to 45 acres, and capable of extension, if necessary. In that communication we have entered into full particulars as to the advantages of the site proposed, and we have given our opinion as to what ground will be wanted for the proposed orchard: the subject need not be further referred to here. I would only express a hope that the site be sanctioned without loss of time. This is most desirable for two reasons:

First.—A large number of grafted fruit trees of the finest English and French sorts, besides English stocks for grafting upon, was received from England about a year ago, and

a second supply more recently. On their arrival these were put down temporarily in a nursery within the cantonment, which had been prepared for them by Captain Birney. These plants are now in a very thriving state, and it is absolutely necessary that they be, without further delay, planted out in the sites they are permanently to occupy. They were got out for the purpose of being propagated from, and they are now ready for a commencement being made. But they must first be planted out in a proper site. The cantonment garden near to which they are at present located, is quite unsuitable for propagation purposes. The soil is poor, the water-supply insufficient, and the situation bad. Were the nursery site adopted as recommended in the communication above referred to, these trees might be at once removed to it, and propagation commenced as soon as they have established themselves there.

Secondly.—The fuel question is so very urgent indeed that no time ought to be lost in making commencement of nurseries, and if the approaching rainy season be allowed to slip away without active steps being taken, another year will be lost. A considerable amount of experience has been gained from the operations that have been already carried on by Captain Birney and Mr. Craw in connection with the station garden within cantonment. This garden site originally extended to about 30 acres, and a tasteful design for laying it out was planned by Mr. Craw. About half of the ground however was taken up for other purposes, and the piece that remains for the garden possesses soil of extreme poverty, and but a poor water-supply. In a small plot of land below this garden, the fruit nurseries already alluded to have been made, as also nurseries of Deodar and other species, and of Australian gum and acacia trees.

Both nurseries are in made-up ground, the natural soil being too poor for the purpose. Any extension of nursery in such soil would be simple waste of money (even were there space, which there is not), as success could only be obtained by the expensive process of bringing good soil to the plants. A number of seedling Australian trees of various species was last year removed from these nurseries and planted out in groups of about forty in different parts of the hill. This was done as an experiment, and from it we have learnt that gum trees will thrive almost on any part of the hill. The growth of some of these gum trees in Captain Birney's private garden has been really astonishing. I would therefore most strongly urge the immediate adoption of the nursery site recommended, the ground of which is in a great measure ready prepared for the reception of seed.

13. *The kinds of seeds to be sown.*—Of timber trees I would recommend the following as the chief species to be sown in nurseries:

Indian.

Deodar.
Toon.
Kakar,—(a fine furniture wood).
Walnut.

English.

Larch.
Scotch Fir.
Ash.
Beech.
Elm.
Oak.
Sweet Spanish Chesnut.

Australian.

Red Iron Bark (Eucalyptus.)
Box (Eucalyptus rostrata.)
Yellow Box (Eucalyptus sp.)
Bastard Box (Eucalyptus sp.)
Red and white stringy Bark (Eucalyptus.)
Blue gum (Eucalyptus punctata.)
White Butt (Eucalyptus sp.)
Black Butt (Eucalyptus sp.)
Swamp Oak (Casuarina stricta.)
River Oak (Casuarina quadrivalina.)
Forest Oak (Casuarina Tuberosa.)

The Australian species above mentioned all yield valuable timber for building, engineering and other purposes. No timber can however be more suitable for building in the hills than Deodar, and, although the Australians grow faster, it should be planted out largely.

2nd, the establishment of nurseries of trees yielding wood suitable for fuel and for building (but especially the former), from which young stock may be supplied for transplantation to permanent situations in the forest and waste lands near the station, so that a continued and plentiful supply of timber may be secured for the cantonment. We also understand that in the choice of a site suitable for the acclimatization of new and useful plants, and adaptability to the purposes of a pleasure ground are to be kept in view as minor considerations.

3. In endeavouring to carry out these objects, the requirements that we have kept steadily before us have been (1) suitability of soil and exposure; (2) a plentiful supply of water; (3) convenience of access and nearness to the station and to the localities where plantation is likely to be carried out. The site which in our opinion is most suitable for the purposes indicated, is that marked on the accompanying map. It extends to about 45 acres, and occupies some slopes and shallow ravines facing north-east in the second or middle of the three tea plantations that were bought from Mr. Troup. It lies on the side of the hill beneath the unfinished house which Mr. C. Troup had intended for his own residence, but is a good way down the side of the hill, so that it does not in any way encroach upon building sites on the ridge. It lies also considerably lower than the house at Oaklands, and is separated from the tea plantations under Oaklands by a low spur of hill running north-east.

4. The soil consists of a rich loam formed chiefly of decayed vegetable matter, and of great depth. It is in fact extremely good, and we met with no equally large piece of ground of such uniform excellence in this respect. As it consists of slopes, all tendency to the retention of excessive moisture is counteracted, while, on the other hand, the slopes are not so extreme as to produce undesirable dryness.

5. The water-supply is extremely good; each of the ravines included in the site contains a spring.

6. Having been laid out as a tea garden by Mr. Troup, the land is already clear of forest and of weeds. It has been besides levelled to a great extent. Much preliminary expense, besides time, would, therefore, be saved were this site decided upon, and the operations of planting and sowing might, in fact, be at once begun. The saving of time is a highly important consideration. Last year a large number of grafted English fruit trees of all sorts, besides a quantity of English stock for grafting upon, were got out from England. These were put into a small nursery within cantonment garden. These plants still remain there, and it is imperative that during the coming rains they be planted out in the sites they are permanently to occupy. If this is not done during the present year, the plants will have become too large to be removed with safety, besides time for propagation will be lost. It is not of the slightest use to think of planting them out permanently *in the present station garden*, as the soil is by far too poor, the water-supply too scanty, and the situation too much exposed to visitors.

7. If the site now proposed be sanctioned, not only can these fruit trees be transplanted during the ensuing rains, and propagation be begun, but the large collection of seeds of Australian fuel and other trees now in hand can be sown at once, and thus a whole season be saved. The necessity of arrangements for fuel plantations being at once made and energetically carried out, is most apparent to us both, as it is quite clear that the sources from which supplies of fuel are presently derived are very limited indeed, and that if they are not speedily relieved of the drain upon them, it is only a question of time when Raneecket shall be as bare and dry as the neighbouring station of Almorah. The proposed site lies, moreover, in the very middle of one of the parts of the hill, and close to a second, which having been cleared entirely of natural timber ought to be the first spots to be planted, and which having been used as tea gardens stand ready prepared for the reception of young trees.

8. In case exception may be taken to the somewhat irregular shape of the proposed site, we beg to explain that we have carefully excluded all indifferent and unsuitable ground, and endeavoured to secure a good water-supply.

9. With regard to the latter matter in particular, we beg to explain that the narrow piece of ground which projects above the upper pathway, marked in the map, has been taken in, because we consider it of the greatest importance to secure the whole of the ravine, so that the stream of water which issues in it below the pathway may not be interfered with by injurious cutting and clearing of trees and bushes in its upper part above the pathway.

10. Although the site we have indicated contains, in our opinion, no useless or bad pieces of ground, we respectfully beg to state that we recommend it in its entirety, and not as a plot of which only a portion may be selected. If, however, the whole be considered too large, the only curtailment of its extent which we consider compatible with its retention for the purpose for which we have chosen it, would be to cut off the piece lying to the north and west of the dotted line indicated in the map. But even this we consider undesirable, and an area of 45 acres is, after all, by no means a large one for a plantation scheme of any value.

From R. P. COLVIN, Esq., Deputy Conservator of Forests, North-Western Provinces, to the Officiating Secretary to the Government, North-Western Provinces,—No. 115, dated Nynee Tal, the 4th July 1871.

IN forwarding the accompanying report of a site for orchard and fuel propagation plantations at Raneekhet, I would point out that both Dr. King and Mr. Craw have very carefully examined all the country near the station; and although I have not had an opportunity of inspecting the proposed site, I can most confidently endorse their views on the subject, for I feel sure that for this work more competent officers could not have been selected.

2. It will be seen by the report that if anything is to be done this year, the ground should be made over to the Forest Department at once; for, if the rainy season is lost, nothing much can be done until the rains of 1872.

3. If the fruit and fuel propagations are to be carried on on a large scale, 45 acres is not a bit too much; but should His Honor think the plot too large, I would suggest that the curtailment be effected according to the suggestion contained in the report, for Dr. King and Mr. Craw have evidently weighed the matter very carefully.

4. In case there is likely to be delay in *officially* making over this ground to the Forest Department, I would propose that partial sanction be given, so that Mr. Craw may plant out the English fruit stock, sow the Australian and other seeds, and go on with the propagation, otherwise the rains will have passed away and a whole year have been lost.

5. A map (the return of which is solicited in due course) of Raneekhet is enclosed, showing the proposed site, &c.

6. This letter complies with G. O. No. 33F—C., dated 7th February last.

From MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Secretary to the Government of India, Public Works Department,—No. 143 F—C, dated Nynee Tal, the 12th August 1871.

IN continuation of this Office No. 103 F—C of the 24th July, I am directed to forward, for the information of the Governor General in Council, copy of a memorandum No. 140 F—C, dated 12th instant, issued to the Conservator of Forests, regarding the conservancy of the Raneekhet forests.

2. The Government of India will observe that in respect of the forests within cantonments limits, the Forest Officer will be merely the adviser of the Cantonment Magistrate and Executive Engineer.

Memorandum from MAJOR J. BONUS, R. E., Assistant Secretary to the Government, North-Western Provinces, Public Works Department, Railway Branch, to the Conservator of Forests, North-Western Provinces,—No. 140 F—C, dated Nynee Tal, the 12th August 1871.

WITH reference to the Notification of the 24th July, placing the forests of Raneekhet within a radius of 12 miles round Kampoor Hill under the forest laws, copy of which Notification was sent to Conservator with No. 111 F—C of same date, requests that the Conservator will at once send the Kumaon Forest Officer to Raneekhet to be stationed there, in accordance with the arrangement which was lately discussed between Conservator and Assistant Secretary, and which has received the approval of His Honor the Lieutenant-Governor.

2. Lieutenant Campbell who, it is understood, is the officer in question, should mark out the 12-mile limit at once, and the conservation of the forests within that limit should be strictly enforced so far as the forest lands are concerned, and a map will be prepared in communication with the Commissioner of Kumaon showing the village lands, Troup's estate, and cantonments within the main boundary, and which will be hereafter exempted from the forest laws.

3. The Forest Officer will be responsible for *advising* in all matters within cantonments, but not for the executive charge which will rest in the hands of the Executive Engineer. The latter will act in respect of the forests in cantonments (and also in respect of the Troup estate) in concert with the Cantonment Magistrate and Forest Officer.

From A. O. HUME, Esq., c. B., Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, to the Secretary to the Government of the North-Western Provinces, Public Works Department,—No. 202, dated Simla, the 31st August 1871.

I AM directed to acknowledge the receipt of your letter No. 103 F—C, dated 24th ultimo, forwarding copy of a report by Dr. G. King, and other papers on the forest conservancy and the plantations at Raneekhet, and in reply to state that the Governor General in Council has read Dr. King's very interesting report with great satisfaction, and cordially endorses the praise bestowed upon it by His Honor the Lieutenant-Governor. The recommendations contained in it are excellent, and His Excellency in Council trusts they will be borne in mind and carefully carried out.

2. His Excellency in Council concurs generally in the action taken by His Honor the Lieutenant-Governor on this report; and, with reference to paragraphs 3 and 4 of your letter, desires me to convey his sanction to the establishment of a system of regular forest conservancy over a range having a radius of 12 miles from the Kampoor Hill, as also over the Seonee Forests. His Excellency in Council also approves of the forests in the neighbourhood of Raneekhet being placed under the supervision and control of a local European forest officer for conservancy purposes, and that no trees should be cut either for building or other purposes whether by the people, or for the public service, but as indicated by him. I am directed to request that it may be ascertained whether Mr. Craw, who is at present only temporarily entertained, would be willing to accept the appointment permanently, and on what terms. His Excellency the Governor General in Council considers that Mr. Craw's services may be also most usefully employed at Raneekhet for experimenting upon all trees, plants, and agricultural produce suitable to the climate of the Himalayas.

3. The Governor General in Council cordially approves of the establishment of the plantations (referred to in paragraph 6) for providing a local supply of fuel, as well as of the nurseries referred to in paragraphs 10 to 12, for the experimental cultivation of fruit trees and other vegetable products, both useful and ornamental, suitable to the climate and locality.

4. I am also directed to state that His Excellency in Council will be glad to receive speedy information as to the progress of the work sanctioned at Raneekhet, in conformity with Dr. King's report, and would wish to know, before the end of the rainy season, what is really being done in the way of forming gardens for the propagation of trees and plants.

5. With reference to the subordinate establishment referred to in paragraph 14 of your letter, I am directed to request the submission of a tabular statement in the usual form, in which should be included only such individuals as will be permanently entertained. Ordinary laborers should be regarded as purely temporary, and their pay should be charged to the cost of the plantations.

6. Your letter under reply, with its enclosures and this letter, will be published in the Supplement to the *Gazette of India*.

From A. O. HUME, Esq., c. B., Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, to the Secretary to the Government, North-Western Provinces, Public Works Department,—No. 200, dated Simla, the 31st August 1871.

I AM directed to acknowledge the receipt of your letter No. 143 F—C, dated 12th instant, forwarding a memorandum of instructions to the Conservator of Forests, regarding the conservancy of the Raneekhet forests, and to state that it is the wish of the Governor General in Council that the regulations and restrictions therein prescribed should also be made applicable to the hill called Sir Devi, which lies between Raneekhet and Almorah, and which is approached by the Runi Spur.

Tobacco Cultivation in Southern India.

From J. BROUGHTON, Esq., Government Quinologist, to the Acting Sub-Secretary to the Board of Revenue,—
dated Ootacamund, the 25th May 1871.

REFERRING to Government order No. 1606 of 21st October 1870; in Revenue Department, I have the honour to give a report on the large number of specimens of tobacco I have received, and on the general question of tobacco-cultivation in South India.

2. The specimens received have been very numerous, and comprise apparently all the good indigenous tobaccos grown in this Presidency. As the best mode of analysis of these has been a subject of much consideration with me, I will first append a tabular statement of the results I have obtained after much thought of the various points on which information was necessary. It will be perceived that the list comprises nearly every possible variation in the amounts of the constituents determined by the analysis. To these results I append the numbers yielded by the Shiraz tobacco grown in Tanjore, received from Revenue Board, and those obtained with some cigars given me by Dr. Ross here, and which are referred to in Board's Proceedings No. 6619 of 12th November 1870.

No.	Tobacco-specimen from	Per cent. of ash.	Per cent. of carbonate of potash in ash.	Per cent. of nicotine.
1	Vizagapatam, Vizagapatam, No. 1, 1st sort	22.653	12.5	1.41
2	Do. do. „ 1, 2nd sort	20.185	17.83	1.45
3	Do. do. „	26.339	3.29	2.45
4	Do. Chiparapilly, No. 2	17.544	9.6	2.37
5	Do. Ankapilly, „ 3	18.592	8.01	5.40
6	Do. Srungavarapukota, No. 4	20.740	9.91	5.49
7	Do. Vizianagram, No. 5	20.411	7.2	4.54
8	Trichinopoly, Trichinopoly A	22.829	6.05	2.52
9	Do. do. B	21.485	8.16	2.41
10	Do. do. „	24.474	5.29	1.83
11	Do. (Cigars) Talampatty Pulvor	20.396	8.25	3.28
12	Do. do. Natapur	26.848	4.42	4.55
13	Do. do. Valicundapuram	23.108	3.91	4.15
14	Bellary, Hospet	19.933	3.46	3.74
15	Do. Raidroog	18.931	13.29	1.70
16	Do. Harpanhully	20.29	3.75	4.99
17	Do. Sundoor	20.114	4.40	2.41
18	Nellore, 1st sort	19.422	8.12	2.16
19	Do. 2nd sort	18.606	5.81	1.83
20	Cuddapah, Pullampet A.	20.701	4.62	2.03
21	Do. do. B.	20.507	3.45	1.33
22	Do. Sidhout C.	23.951	4.07	2.99
23	Do. Budwail E.	22.453	3.71	2.70
24	Do. Chinnia Dandloor G.	16.255	4.14	5.1
25	Do. Prodatoor H., No. 1	21.698	4.49	2.75
26	Do. do. I., „ 2	16.432	6.15	4.82
27	Do. Jammalmadagu J.	22.105	3.52	5.07
28	Do. do. Ponnatolah K., 1	17.327	5.93	5.36
29	Do. Madanapully P.	18.743	5.95	7.44
30	Do. do. Q. 1	20.18	2.28	7.23
31	Do. from Board of Revenue	24.75	4.36	1.70
32	Tanjore, Tanjore	20.745	8.71	2.49
33	North Arcot	22.895	10.06	4.40
34	South Arcot, Ravathavallur	21.115	11.92	3.99
35	Nilgiris, Todanad	20.596	29.26	1.43
36	Do. Koondahs	17.786	6.37	2.95
37	Kurnool, Nundial (masub soil)	4.030	4.31	1.41
38	Do. do. (ragud soil)	22.535	0.78	2.49
39	Do. do. (local soil)	16.85	9.89	1.33
40	Do. Markapur	22.767	3.89	2.45

No.	Tobacco-specimen from	Per cent. of ash.	Per cent. of carbonate of potash in ash.	Per cent. of nicotine.
41	Kurnool, Cumbum	19.22	9.77	1.87
42	Coimbatore, Coimbatore	22.856	2.94	3.32
43	Do. do.	22.606	5.64	4.95
44	Do. do.	19.923	7.92	4.90
45	Do. Pullachy	24.987	4.39	1.95
46	Do. Moocaspoodoor	25.73	7.67	2.24
47	Do. Coorchy	26.39	7.93	1.17
48	Do. Poondoray Seemoor	23.34	2.65	1.29
49	Do. Aval	23.49	19.97	1.46
50	Do. Monigumpollum	26.65	2.61	2.95
51	Shiraz tobacco from Tanjore	22.86	2.99	1.91
52	Cheroots supplied by Dr. Ross	28.50	0.39	2.04
53	Do. made from Shiraz tobacco grown at Tanjore	25.68	5.98	1.67

3. With respect to the above analysis and to the determination of the above particular constituents, some remarks are required. According to our present knowledge, the quality of tobacco, unlike substances where excellence depends on the preponderance of a special or a few special constituents, cannot always be inferred from an analysis, however complete it may be. It would be absurd to conclude respecting the quality of wine, for instance, from an analysis stating the percentage of spirit, sugar, tannin, etc., such as could be easily made. These numbers would give no information whatever as to flavour, age, and other qualities, upon which the goodness depends, and would throw no light whatever on the still slighter variations of quality which appeal more particularly to the tastes of individuals: as with wine, so with tobacco. Chemistry, according to our present knowledge, cannot indicate the constituents or the proportional amounts which shall cause the results of burning it in an incomplete manner to possess the greatest excellence of flavour; it can only lay down the broad proportions in which certain constituents must occur to produce this excellence. But these proportions may actually occur in a tobacco, and yet the greatest excellence of flavour may possibly not follow.

4. What is usually called the strength of tobacco in smoking depends immediately on the amount of contained nicotine. A tobacco that contains over four per cent. of this powerful alkaloid is a strong intoxicating tobacco, while that which contains less than three per cent. is called mild. It has been found, as an invariable result of experiment, that the finest tobaccos as the Havana, Manila, Cuban, and others, do not contain more than 2 to 3 per cent. of nicotine. To this result there is no exception that I am aware of, though of course by the constant custom of smoking strong tobaccos, a few persons may even become so as to prefer it to the finer kinds. These exceptional tastes do not interfere with the otherwise universal currency of the rule. It is remarkable that among the numerous Indian tobaccos, I have but found two instances in which as much nicotine as is found in Virginian or French tobaccos, where it amounts to nearly 7 per cent.

5. Another important constituent of tobacco of high quality is the organic salts of potash. As these, in the burning of tobacco, become converted into the carbonates which are found in the ash, I have therefore in each case made a determination of the amount of carbonates of potash in the ash of the specimens. The whiteness and permanency of the ash of a cigar depend entirely on the amount of potassic carbonate it contains. The presence of potash salts certainly modifies the burning of tobacco in a peculiar way to the improvement of its flavour, and also positively facilitates its burning. It will be familiar to the experience of every smoker in this country how far more difficult it is to retain alight a country cheroot, with its grey scattering ash, to the white coherent ended Manila or Lunka. These remarks appear trifling; but it is on these trivial matters that the quality and value of tobacco for smoking depends. Organic salts of soda are practically absent from tobacco.

6. Nitrates are found in occasionally very considerable amounts in all tobaccos, and especially in those of this country. Though they effect the combustibility of the tobacco very considerably, they have a far less influence in this respect than the organic salts of potash. It has been shown by M. Schlöring, Director of the late Imperial Tobacco Works in Paris, that the presence of nitrates in quantity has no connection with the quality of the tobacco. I have therefore not made any estimation of the amounts of nitre present in the specimens received.

7. An examination of the table of analysis on the principles enunciated above shows that Nos. 1, 2, 4, 7, 8, 9, 11, 15, 18, 32, 39, 41, and 46 possess in the main the qualifications necessary to tobacco of good quality. It is to be remarked also that the tobacco of Vizagapatam and Trichinopoly are, as a whole, of better quality than those of other parts of South India—a fact also of experience. Bellary, Nellore, Tanjore, Coimbatore, and Kurnool also contribute single specimens of tobacco of good quality, though Nos. 15, 39, and 41 possess on actual smoking, a far too strong and pyroligneous flavour, to be agreeable to a smoker unaccustomed to the tobaccos. Tobaccos Nos. 35 and 36 furnish important examples of how it is possible by special culture to modify the constituents of a tobacco-ash. It is well known that the soil of the Nilgiris is exceedingly poor in salts of lime to a very exceptional degree, while from the decomposing felspar, it is comparatively rich in potassic salts. The analyses show that the tobacco grown on these hills yields an ash in which the ordinarily occurring calcic carbonate is nearly entirely replaced by potassic carbonate, so that in one specimen the latter substance occurs in the ash to the large amount of 29·26 per cent. Though the cultivation of tobacco on these hills is of the roughest possible kind and produces consequently a most inferior product, I cannot but consider the result now mentioned as most important and suggestive.

8. I have received with the specimens of tobacco, in many cases carefully collected, specimens of the soils on which they were grown. I have examined these, and find in all cases considerable amounts of calcic carbonate. The presence of this substance in abundance, in connection with a comparative absence of potassic salts, must inevitably cause the ash of the tobaccos to abound in calcic carbonate, and thus depreciate its quality. I am quite of opinion that it is this cause which produces the general inferiority of Indian tobaccos. An examination of the first fifty of the analyses given shows that thirty-nine kinds contain less than nine per cent. of potassic carbonate in their ash.

9. But with ordinary European smokers, for whom the English and Continental tobacco markets exist, and who are accustomed to the use of the fine foreign tobaccos, I do not think that Indian tobaccos of even good quality would be found agreeable. It is stated in a memorandum of Dr. Hooker's, published in the *Nilgiri Gazette* of April 19th, 1870, that he was informed by the brokers "that the Indian and Colonial tobacco is very poor indeed." A slight apprenticeship is always necessary before Anglo-Indians relish even the finest Indian cheroots, though custom subsequently brings a full appreciation of their good qualities. For export it, therefore, appears necessary that not only should the tobacco be of good quality, but that it should also be of the very kind to which the market is accustomed. In other words, the kind of tobacco exported should not be of the Indian but of foreign varieties. If Indian tobacco be exported, it should be most carefully selected; and against this the fact remains, that there is in this country a most ready sale for the better kinds, and consequently with them there is but little profit in export.

10. In Proceedings of Board of 12th November 1870, No. 6619, enclosure No. 2, Dr. Ross describes the growth of some Ohio and Shiraz tobacco. He has been good enough to give me a few cheroots made of the tobacco. Though they contain the amount of nicotine found in the best specimens of tobacco, they are abominable in flavour. Their ash is black, and contains but 0·39 per cent. of potassic carbonate. This is the cause of the bad quality and black ash. The tobacco was grown on soil rich in lime salts, and was not manured with manures rich in potash. It is quite certain that the finest foreign tobaccos will not yield a good produce in most parts of South India unless carefully and systematically cultivated.

11. The tobacco from Shiraz seed, which I received from Tanjore, is of better quality, but it is undoubtedly affected by the small amount of potash salts in the soil in which it was grown. Had the soil been manured with the ashes of plants, this tobacco would doubtless have been of fine quality. As it is, the ash is not good, and the flavour, though not bad, is not equal to that of real Shiraz.

12. The cheroots made from the Shiraz tobacco are much better. Whether grown on different soil, or from some local cause, they are an improvement on the latter specimen. Their ash contains 5·98 per cent. of potassic carbonate, and the tobacco somewhat less nicotine. The cheroots are good, of pleasant flavour, but are too new to have reached their best flavour.

13. In consequence of the directions issued by the Board, I have received full accounts of the method of cultivation and curing of tobacco. The former does not appear to differ much in various parts of South India. From Nellore, North Arcot, Coimbatore, Trichinopoly, it is very significant to learn that tobacco is improved in quality by being watered by water from brackish wells. But the method of curing differs greatly both in the manner in which the tobacco is fermented, and the duration of time during which it is exposed to fermentation. Though these variations doubtless have considerable influence on the flavour of the tobacco, I have had no experience on their effects, and can only state my conviction that the method of curing which produces the best tobacco will be found the best to employ, as it is the most simple. The sprinkling with water containing jaggery and the bark of *Acacia Arabica* can hardly fail in being both useless and injurious. One or two specimens of tobacco

which I have received were spoilt for smoking to an English palate by the amount of jaggery they contained.

14. In order to cure the very general defect of Indian-grown tobacco, I would strongly advise that the plots of ground on which the foreign tobaccos are grown should, in addition to cattle manure, be also manured with the ashes of wood or plants. If these could be prepared by burning on the ground, it would be better. I find it is customary in Manila to do so, and it was a result of M. Schlöring's experiments in France that this treatment increased the amount of potash salts in the tobacco. I have no doubt whatever that by this treatment tobacco of the finest quality could be grown in India.

15. From what I know of the soil of Wynaad, I have a strong conviction that it would be well suited to tobacco cultivation. Like the soil of the Nilgiris, it contains but little calcium salts and much potash. Wynaad possesses also a climate which appears very favourable to the plant.

16. The large amount of ash yielded by tobacco fully explains why it is an exhausting crop. The elaborate arrangements customary in Trichinopoly for its manuring doubtless are a cause of the high local reputation of the tobacco there produced. Poor soil and lax cultivation will never produce good tobacco. In all places where the tobacco has a reputation it appears that much care is taken both to manure it highly and to cure it with great attention, after it is harvested. Unless this be done, it will be useless to expect favourable results in India, or anywhere else.

17. I shall be glad to receive tobacco grown from foreign seed for analysis, as soon as that grown near the Horticultural Society's Gardens, Madras, and on the Government Experimental Farm, is ready. I should much like to compare the results of tobacco manured with that grown without manure, and also some grown with a plentiful manure of plant ashes with that grown on a small plot unmanured.

THE acknowledgments of the Board are due to Mr. Broughton for his masterly and interesting report above recorded, which will be communicated to Government with a suggestion that the report be as extensively published as possible.

2. The attention of the Superintendent of the Government Farm is drawn to Mr. Broughton's remarks in the last paragraph of his letter.

3. The result of the experimental culture of tobacco at the Government Farm, desired by Government in their Proceedings, Revenue Department, 21st October 1870, No. 1606, will be communicated as soon as known.

Submission of Reports by Local Governments and Administrations on the state of the weather and prospects of the crops.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 78-93, dated Simla, the 6th September 1871.

READ again the following papers :

Circular to Local Governments and Administrations, Nos. 26-35, dated 31st July 1871.

Ditto, Nos. 55-66, dated 23rd August 1871.

Letter to Cotton Commissioner, Central Provinces and Berar, No. 68, dated 23rd August 1871.

Telegram to Chief Commissioner, British Burmah, No. 70, dated 25th August 1871.

Read also the reports on the weather and the prospects of the season in several Provinces, published in the Supplement to the *Gazette of India* of 2nd September 1871.

OBSERVATIONS.—His Excellency the Governor General in Council regrets to notice that no returns of the state of the weather and the prospects of the crops have been received from either Madras or British Burmah.

2. The returns from Sindh, Oudh, and the North-Western Provinces are somewhat meagre.

3. The report from Bengal, though full as regards floods, is wanting in details as to the state of the crops and the prospects of the season.

4. The return from the Central Provinces shows exactly the nature of the particulars required for each Division or important provincial Sub-Division.

5. In addition to these divisional or sub-divisional reports, the opinion of the Local Government or Administration, as to the prospects of the crops in the Province or Presidency generally, should be recorded.

6. The Cotton Commissioner has apparently neglected to forward the special telegraphic report on the prospects of the cotton crop generally, which was required.

7. The next telegraphic report should be despatched by Local Governments and Administrations on Thursday, the 14th September, so that it may reach the Government of India by the 15th without fail, and appear in the *Gazette* of the 16th.

8. His Excellency in Council attaches great importance to these returns, and trusts that on future occasions, they may be submitted by all Local Governments and Administrations with the utmost punctuality, and in all necessary detail.

Government of Madras.	Resident at Hyderabad.
" Bombay.	Commissioner, East Berar.
" Bengal.	" West "
" North-Western Provinces.	" Sindh.
" Punjab.	Cotton Commissioner, Central Provinces and Berar.
Chief Commissioner of Oudh.	Agent, Governor General, Central India.
" " Burmah.	Ditto ditto, Rajpootana.
" " Central Provinces.	
" " Mysore and Coorg.	

ORDER.—Ordered, that a copy of this Resolution be forwarded to the Local Governments, Administrations, and Authorities noted in the margin.

Death of Captain J. P. Basevi, R. E., Deputy Superintendent, Great Trigonometrical Survey of India, whilst carrying on the pendulum observations in connection with the other geodetical operations of the Survey Department.

From MAJOR T. G. MONTGOMERIE, R. E., Officiating Superintendent, Great Trigonometrical Survey of India, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 114—1036, dated Mussoorie, the 17th August 1871.

It is with the deepest regret that I have to report the death of Captain J. P. Basevi, R. E., Deputy Superintendent, 1st Grade, Great Trigonometrical Survey, on the 17th July 1871, whilst carrying on the pendulum observations in connection with the other geodetical operations of this Department.

In order to carry out the programme proposed by Colonel Walker in communication with and under the auspices of the Royal Society, Captain Basevi had to take observations at two or more stations on the very elevated table-land of Tibet and Ladak. With this object he marched from the Punjab to Kashmir and thence to Ladak, where he completed the necessary observations at one station 15,500 feet above the sea. He then marched to the extreme confines of Ladak and crossed into the margin of Great Tibet, and had actually reached a fitting place for taking the last observations required, when he was unfortunately seized with the fatal illness from which he died at the early age of 39.

This lamentable occurrence took place two marches to the east of Kiyam, in the Changchenmo Valley, at an elevation of about 17,000 feet above the sea. Captain Basevi was then some forty marches from Murree, the nearest British station, and 32 marches from Kashmir, which was the nearest point from which he could have received medical aid.

His death was undoubtedly due to his devotion to his work, and, occurring as it did under such peculiar circumstances, I hope that an application which I intend to submit as to some extra pension for the widow, will meet with favorable consideration from the Government of India.

Captain Basevi was an officer of rare scientific and general attainments, and had devoted himself thoroughly to the work of this Department.

He had done good service in every part of India, from Ladak to the southernmost point of the Madras Presidency, one of his special charges having been the measurement of the Cape Comorin base-line; in all, his merits were conspicuous, but the crowning work of his life was the taking of the pendulum observations for the whole continent of India. To this most difficult task he devoted a large amount of talent and labor, of which it is hardly possible to convey an adequate idea. Commencing at the end of 1865 he pushed on the work with such energy that, at the time of his death, he had finished all the observing actually required over twenty-six degrees of latitude, with the exception of those at Karachi and Aden, which would have given but little trouble.

His labors will supply exceedingly valuable data towards solving the most interesting and difficult scientific questions as to the ellipticity of the earth and certain variations in the density of its crust.

Though Captain Basevi was anxious to observe at one other elevated station in Tibet, his work, even as regards that portion, may be considered complete; but it is much to be regretted that he was not spared to reduce his observations—a task for which he was eminently qualified with his accumulated experience of the last seven years. The Government of India has deservedly won a high reputation for its contributions to the cause of science, which have been such as to place it in the foremost rank with the most enlightened Governments of Europe. It is gratifying to think that these last labors of Captain Basevi are likely, when reduced and published, to assist in maintaining that high reputation and possibly to enhance it.

All proper arrangements will be made to complete what little remains to be done in the way of observing, with a view to finally reduce and publish the results. These will remain a noble and lasting monument of Captain Basevi's work, sufficient, I think, to establish a European reputation, which it is greatly to be regretted he did not live to enjoy.

I have no hesitation in stating that the Government of India has sustained a very great loss by the death of such a talented and devoted officer as Captain Basevi while in the prime of life. His matured experience would have been most valuable, not only in the Great Trigonometrical Survey, but in any other Department of Government to which it might have been applied.

From A. O. HUME, Esq., c. B., Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, to the Officiating Superintendent, Great Trigonometrical Survey of India,—No. 175, dated Simla, the 1st September 1871.

I AM directed to acknowledge the receipt of your letter of the 17th ultimo, No. 114—1036, reporting the death of Captain J. P. Basevi, R. E., Deputy Superintendent of the 1st Grade in the Great Trigonometrical Survey of India.

2. The Governor General in Council desires me to express the very great regret with which he has heard of this melancholy event. His Excellency in Council entirely agrees in your high appreciation of Captain Basevi's merits. The State has lost in him a most able and talented officer, whose patient and self-denying labors entitled him to the gratitude alike of the Government he served and of the world of science to whose interests he devoted himself. His sudden death in the prime of life, at a moment when he had nearly completed the important series of observations he had been engaged on, and when he was about to proceed to England to bring them to a close, and thus, it might have been hoped, reap the well-merited reward of years of ceaseless toil, is most deeply to be regretted; and the Government of India are most anxious that every endeavour should be made to complete Captain Basevi's all but finished work, and to publish it in such a form as may render it a fitting memorial of his services and their appreciation of them.

Telegraphic Report from the Commissioner of West Berar, dated 5th September 1871, on the state of the weather and prospects of the harvest.

WE have had a good fall of rain, three inches, in Mulkapur Taluk since the 30th, and it is believed to have been very general throughout the Division. Great hopes now of the crops, but wells are still exceedingly low.

Appointment of W. W. Hunter, Esquire, LL. D., as Director General of Statistics to the Government of India.

Extract from the Proceedings of the Government of India in the Department of Agriculture, Revenue, and Commerce,—Nos. 102-18, dated Simla, the 8th September 1871.

READ—

A Plan for an *Imperial Gazetteer of India*, dated 29th November 1869, from W. W. Hunter, Esq., to the Secretary to the Government of India, Home Department.

A Note on the progress of the statistical operations in connection with the *Imperial Gazetteer* in 1870 and 1871, by W. W. Hunter, Esq., dated 1st June 1871.

Office Memorandum to Financial Department, No. 64, dated 2nd August 1871.

„ „ from „ „ „ 3189, dated 30th August 1871.

RESOLUTION.—The Governor General has had under his careful consideration the question of the preparation of Provincial Gazetteers, and their eventual consolidation into an Imperial Statistical Account of India.

2. Three distinct series of operations have in time past been undertaken or encouraged by the Government, with a view to obtaining trustworthy accounts of the country, such as might form a Gazetteer of India; the whole representing a very large outlay, commencing as far back as 1769, and one of the efforts* costing £30,000 for merely collecting the materials for part of a single Province.

* That of Dr. Buchanan under the instructions of the Governor General in Council in 1807.

3. From a variety of causes, all more or less proceeding from defective organisation, this large expenditure, while accumulating isolated materials of great value, failed to yield any systematic and comprehensive result. At length in 1855 the Court of Directors directed the Governor General to procure by local enquiries, and “with as little delay as possible, such information as may be effective for rendering the work a faithful register of the state of the country as at present existing.”*

* Despatch No. 1 of 1855, Statistical Department, dated 21st February 1855.

4. Since then various attempts have been made by the Local Governments to give effect to these orders. It was practically found that no satisfactory basis existed for the work, and as early as 1862 the subordinate Governments began to strike out new plans for drawing up a statistical and geographical account of their territories. In March of that year the Madras Government issued orders for a series of District Manuals, which should exhibit the entire Presidency in minute detail. Subsequently, Sir Richard Temple inaugurated the statistical operations which have produced the *Gazetteer* of the Central Provinces; and more recently the Collectors in Eastern Bengal were directed to draw up a series of District Reports, which were printed in 1868 under the title of the “Principal Heads of the History and Statistics of the Dacca Division.”

5. The divergence from the original plan which had thus taken place under the Local Administrations, was accepted by the Supreme Government: and in May 1867 it was suggested whether a work similar to the *Gazetteer* of the Central Provinces might not with advantage be compiled for Bengal, the Panjab, Oudh, Mysore and Curg, British Burmah, and Haidrabad. Three months later the plan received the approval of the Secretary of State, and on the 19th October 1867 the Government of India addressed all the Local Administrations, requesting that “steps may be taken for the compilation of a *Gazetteer* in accordance with the wishes of Her Majesty’s Government.”

6. Various schemes were set on foot to give effect to these orders, some of them so costly as to be altogether disproportionate to the results to be attained. But His Excellency in Council observes that excessive costliness is not the only unfortunate effect of the want of organization, which left each Local Government to invent a scheme of its own, irrespective of what was being done in other Provinces. There was, in fact, no unity of plan or central supervision, and the results did not contain the materials required for the comparative statistics of the empire. Meanwhile the necessity of some systematic organization had been pressed on the Government of India from various quarters, particularly by the Commercial Community and the Asiatic Society of Bengal. This latter body urged that, without a uniform plan, "the value of each local *Gazetteer* will, in a measure, be depreciated, and whenever the compilation of the *Gazetteer of India* shall be determined on, a considerable amount of the work will have to be gone over again *de novo*." Accordingly, in July 1869, His Excellency in Council declared his conviction that immediate steps should be taken to ensure uniformity, and to that end appointed Mr. W. W. Hunter, LL. D., of the Civil Service, to visit the Local Governments and ascertain what had been done in each, with a view to his drawing up a comprehensive scheme, prescribing the principles for the compilation of the Provincial *Gazetteers* and for their ultimate consolidation into one work.

7. In November 1869 Mr. Hunter submitted his Plan for an Imperial *Gazetteer* of India, in which he exhaustively explained the materials already available, and arranged for that systematic organization and central control, the absence of which had proved fatal to the completeness of all the previous efforts from 1769 to 1855, and to the progress of the present one throughout the fifteen years during which the operations have been going on between 1855 and 1870. The final consideration of his Plan was, however, postponed till the then contemplated Department of Agriculture, Revenue, and Commerce should be formed. Meanwhile his services were temporarily retained on deputation, and after an interval the deputation was renewed with a view to his arranging, so far as his position permitted, for uniformity in the provincial compilations in progress during the past eighteen months. He also continued to perform his duties as Compiler of the *Bengal Gazetteer*.

8. Even the moderate degree of supervision which he was thus able to exercise on the operations, has produced favorable results. The work published during the two years, 1870 and 1871, will form five volumes, containing 2,000 pages, and dealing with a territory of 131,453 square miles. This area, although between two and three times the size of England and Wales, forms only a fragment of the whole work to be done. The general statistical operations will extend over ten separate Governments, which, with their feudatory States, administer a territory of 1,556,836 square miles and govern a population estimated at 200,424,072 souls. The *Gazetteer of India* represents, therefore, a series of local enquiries and comparative statistics spread over an area but little less than that of all Europe, excepting Russia. Throughout this vast territory widely different schemes have been propounded by the Local Administrations, some of them involving a very extravagant outlay, others of too meagre a character. Each Local Government has given its own interpretation to the work, and the experience of the last few years shows that, in the absence of a central organization, the cost of the enterprise will swell to an enormous total, while the same heterogenous incompleteness which rendered all previous efforts infructuous, will again result.

9. Meanwhile the Provincial *Gazetteers* have reached a stage which imperatively demands some uniform system and some guiding authority. It seems to the Governor General in Council that the time has come for taking definite steps to ensure that uniformity of plan without which it is hopeless to look for a successful issue from so widely extended a statistical operation. It is desirable that a large amount of individual freedom should be permitted to

each of the Local Governments, but it is absolutely necessary that each of the Provincial *Gazetteers* should contain the materials requisite for the comparative statistics of the empire. Without a central guiding authority, economy and uniformity are alike impossible. The Governor General in Council is of opinion that this central control can best be obtained by the Government availing itself of the suggestions contained in Mr. Hunter's Plan, and by securing for the execution of the design the supervision of the designer. Subject to the approval of the Right Hon'ble the Secretary of State, His Excellency in Council is, therefore, pleased to appoint Mr. Hunter Director General of Statistics to the Government of India for the above purpose, and for the consolidation of the Provincial Accounts into the *Imperial Gazetteer*. Mr. Hunter will also continue to conduct the operations of the *Bengal Gazetteer*, the compilation of which, the Government has ascertained, can be carried on in connection with his new duties.

ORDER.—Ordered, that a copy of this Resolution be forwarded, for information and guidance, to the Local Governments and Administrations noted in the margin,* and for information to the several Departments of the Government of India.†

* Government of Madras.	Chief Commissioner of Oudh.	information and guidance, to the Local Governments and Administrations noted in the margin,* and for information to the several Departments of the Government of India.†
" Bombay.	" " Burmah.	
" Bengal.	" " Central	
" North-Western	" " Provinces.	
" Provinces.	" " Mysore and	
" Panjab.	Resident at Haidrabad.	Coorg.
† Home Department.	Military Department.	
Foreign "	Public Works "	
Financial "	Legislative "	

Ordered also, that a copy be forwarded for information and guidance to Mr. W. W. Hunter, LL. D.



The Gazette of India

EXTRAORDINARY.

Published by Authority.

SIMLA, SATURDAY, SEPTEMBER 16, 1871.

FINANCIAL DEPARTMENT.

NOTIFICATION.

ACCOUNTS.

No. 3206.

Simla, the 16th September 1871.

R HIS EXCELLENCY the Right Hon'ble the Viceroy and Governor General in Council has resolved to pay off the Five per cent. loan of the 28th February 1857, raised by the Government of India in pursuance of advertisement in the *Calcutta Gazette* of the 16th January 1857, to which additions or transfers have been made under subsequent notifications; the loan being commonly known as the New Five Per Cent. Loan of 1856-57.

2. It is intended to discharge the loan at the expiration of the term guaranteed in the original notification, *viz.*, on the 16th January 1872, and formal notice of this intention will be published on the 16th October next.

3. In anticipation of such notice, His Excellency has determined to offer to the holders of this loan the option of transferring the amount of their holdings, to the extent of one hundred and thirty-five millions of rupees, into a new loan (which may be called the Transfer Loan, 1872) to be opened upon the following terms:

- (a.)—Promissory Notes will be issued for sums of Rs. 500, and for sums above that amount, in even hundreds of rupees; the notes will be payable to order, and interest thereon will be paid half-yearly, on the 16th January and 16th July in each year.
- (b.)—Interest will be paid on this Loan at the rate of four-and-a-half per centum per annum during the first seven years of currency; and, thenceforward, *viz.*, from the 16th January 1879 inclusive, at the rate of four per centum per annum.
- (c.)—The notes will be issued in a form similar to that employed for the notes of the Four Per Cent. Loan of 1st May 1865.
- (d.)—No part of the loan now announced will be paid off before the 16th January 1882, nor without a previous notice of three months, to be issued at any time after the 15th October 1881.
- (e.)—Applications in writing from persons who may desire to make such transfer should be made to the Secretary and Treasurer of any of the Banks of Bengal, Madras, and Bombay, or to the officer in charge of any Government Treasury at which the interest on the present loan is payable. Such application must be accompanied by the notes which it is desired to transfer, receipted as follows: "Received the contents by transfer into the Transfer Loan 1872, advertised in the *Gazette of India Extraordinary* dated Simla, the 16th September 1871."

(f.)—His Grace the Secretary of State for India has been requested to receive tenders for the transfer, under this Notification, of any notes of the Five Per Cent. Loan of 1856-57 held in England.

(g.)—Interest at five per cent. to the date of advertised discharge will be paid to proprietors, in anticipation, on the surrender of their notes for transfer into the new loan.

(h.)—No application for transfer will be received after the 15th November next.

(i.)—The new Transfer Loan will be allotted to applicants in the order in which the notes tendered for transfer are received, whether in India or in England; the difference of time between England and India being reckoned to be six hours. In case several applications are received simultaneously, which cannot all be complied with, the available amount will be issued rateably in proportion to the amounts of the applications.

4. It being deemed expedient to increase the investment of the Paper Currency reserve, Promissory Notes will be issued to the Currency Department in exchange for coin amounting to not more than twenty-seven millions of rupees, and not more than the excess of the amount of the loan of the 28th February 1857 now outstanding, over 135 millions of rupees.

5. The notes issued to the Currency Department will be in all respects the same, and subject to the same conditions, as the existing notes of the Four Per Cent. Loan dated 1st February 1843, commonly known as the Fifth Four Per Cent. Loan of 1842-43, of which loan they will form a part. The price to be paid by the Currency Department will be the market price of notes of the said loan on the 16th January 1872.

By Order of His Excellency the Right Hon'ble the Viceroy and Governor General in Council,

R. B. CHAPMAN,

Secretary to the Government of India.

THE preceding Notification will be published simultaneously in the principal local *Government Gazettes* in India, and a similar Notification will be published simultaneously by His Grace the Secretary of State in London.

* With reference to condition (i) in the 3rd paragraph, Treasury Officers must record on each note tendered for transfer in due form, the date and hour on which it is received.

By Order, &c.,

R. B. CHAPMAN,

Secretary to the Government of India.

No. 35

of 1871.



SUPPLEMENT TO
The Gazette of India.

SIMLA, SATURDAY, SEPTEMBER 16, 1871.

OFFICIAL PAPERS.

A SUPPLEMENT to the GAZETTE OF INDIA will be published from time to time containing such Official Papers and information as the Government of India may deem to be of interest to the Public, and such as may usefully be made known.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or ten Rupees eight annas if sent by Post.

No Official Orders or Notifications, the publication of which in the GAZETTE OF INDIA is required by Law, of which it has been customary to publish in the CALCUTTA GAZETTE, will be included in the SUPPLEMENT. For such Orders and Notifications the body of the GAZETTE must be looked to.

GOVERNMENT OF INDIA.

HOME DEPARTMENT.

Introduction of Animal Vaccination in Upper Scind.

From the HON'BLE F. S. CHAPMAN, Chief Secretary to the Government of Bombay, to the Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce,—No. 2313, dated Bombay Castle, the 23rd August 1871.

* Memorandum from the Commissioner in Scind, No. 568, dated 10th May 1871, with accompaniments.

Report by the Superintendent General of Vaccination, No. 168.

Report by the Inspector General, Indian Medical Department, No. 2047, dated 23rd May 1871.

Government Resolution No. 1434, dated 2nd June 1871.

I AM directed by the Right Hon'ble the Governor in Council to acknowledge the receipt of Mr. Under Secretary Geoghegan's letter No. 81, dated the 11th instant, and, in reply, to forward herewith copy of the papers* therein asked for, relative to the introduction of animal vaccination in Upper Scind.

From R. WALLACE, Esq., Acting Collector of Shikarpore, to the Commissioner in Scind,—No. 1238, dated Shikarpore, the 3rd May 1871.

I HAVE the honor to submit a copy of a letter No. 71 of 1871, from Dr. J. Leahy, in medical charge of Sukkur, to my address, reporting the first results of the experiments now being tried here of vaccinating from the calf direct.

2. The municipality of Sukkur voted a grant for the above purpose, and Dr. Leahy, at my request, consented to carry out the experiment in addition to his other duties.

3. Though there is some opposition on the part of the Hindoo community, I attribute it to their narrow-minded dislike to all innovation and change.

4. I anticipate that, in course of time, these prejudices will pass away, especially under the active superintendence of Dr. Leahy, who is already very popular among the townspeople.

5. It will be necessary to allow a considerable interval to pass before the results of this experiment can be truly judged; but if, as is supposed, the lymph from the calf retains its full virtue during the hot months, the importance of the new process will be unquestionable.

6. I beg to submit that the exertions of Dr. Leahy in this matter are most creditable to him; and that the public are indebted to him for the trouble and care he has bestowed in carrying out the first attempt to introduce animal vaccination into Scind.

From HONORARY ASSISTANT SURGEON J. LEAHY, in medical charge, Sukkur, to the Acting Collector and Magistrate, Shikarpore,—No. 71, dated Sukkur, the 27th April 1871.

WITH reference to former demi-official correspondence regarding the introduction of animal vaccination into Upper Scind, I have the honor to report, for your information, that the experiment has been in operation here for the last six weeks, under my superintendence, and has proved completely successful.

2. For about three weeks the experiment was conducted in old Sukkur; but calves of a suitable age being no longer procurable there, arrangements were made to obtain a supply in New Sukkur, and up to the present time I have had no difficulty in getting as many as I require.

3. With the view of testing the experiment, I vaccinated several children in Old Sukkur with lymph taken from a calf, and on the same day vaccinated a number of other children with human lymph. The result on contrasting the arms of the two sets of children was highly satisfactory. The vesicles produced from ordinary lymph were by no means of an inferior character, but they were certainly not quite equal to those produced from animal lymph. The latter were full and well formed, and on the eighth day presented in a marked degree the characteristic appearance of the genuine vaccine vesicle.

4. Dr. Keith, now Acting Superintendent of Vaccination in Scind, who is here awaiting a passage to Kotree, very kindly visited Old Sukkur with me this morning, and examined several children vaccinated a week ago with animal lymph. He afterwards accompanied me to the dispensary in New Sukkur, and witnessed the inoculation of four calves from other calves operated upon six days ago, as well as the vaccination of several children from animal lymph. He expressed himself highly gratified with the appearance of the vesicles on the children's arms, and with the quality and quantity of the lymph obtained from the calves.

5. It is a matter of very great satisfaction to me that Dr. Keith should have had an opportunity of observing the manner in which the experiment is being carried out, and of noting its success.

6. The Mahomedans do not seem to have any particular objection to animal vaccination, nor do they object to allow their calves to be operated upon. The Hindoos, on the other hand, not only have a strong prejudice against the use of animal lymph on their children, but appear to look upon the inoculation of their calves as a most aimless piece of cruelty and a great sin.

7. I may mention that the experiment is being conducted at a very trifling cost, and that I shall continue it so long as calves are procurable.

8. I beg to bring to your notice the valuable assistance I have received from Mr. Kadiedad Khan, Mooktyarkar of Sukkur, and from the Fouzdar of New Sukkur in obtaining a regular supply of suitable calves.

From COLONEL W. L. MEREWETHER, C. S. I., Commissioner in Scind, to the Acting Collector of Shikarpore,—No. 567, dated Kurrachee, the 10th May 1871.

IN reply to your letter No. 1238, dated the 3rd instant, I have the honor to inform you that I quite coincide in the encomiums bestowed on Dr. Leahy, for his exertions in connection with the introduction of animal vaccination in Upper Scind, and request you will be good enough to convey my best thanks to that officer.

2. I would also particularly acknowledge the readiness shown by you in supporting the attempt to introduce animal vaccination in your District.

No. 568.

COPIES submitted to Government for information.

Memorandum by SURGEON J. PINKERTON, Superintendent General, Vaccination,—No. 168.

THE experiment of Dr. Leahy, as far as it has gone, is very satisfactory and interesting. I hope he will be able to continue the practice of animal vaccination in Upper Scind. The Hindoos in Bombay have taken readily to animal vaccination, so it may be expected that they will also do so in Scind when they become better acquainted with it.

2. I would beg to suggest that Government acknowledge the services of Major R. Wallace and Dr. Leahy. Although Major Wallace says little or nothing of what he has himself done, I know that it is through his influence and countenance that Dr. Leahy has been able to commence animal vaccination.

Report by A. WRIGHT, Esq., Inspector General, Indian Medical Department,—No. 2047, dated Bombay, the 23rd May 1871.

THE success of the experiments made by Honorary Assistant Surgeon Leahy in animal vaccination is very gratifying, and I consider him deserving of the acknowledgment of Government for his exertions in the matter.

Extract from the Proceedings of the Government of Bombay in the General Department,—No. 1434, dated Bombay Castle, the 2nd June 1871.

Memorandum from the Commissioner in Scind, No. 568, dated 10th May 1871, submitting, for information, copy of a correspondence with the Acting Collector of Shikarpore, relative to the first results of the experiments tried by Dr. J. Leahy, in medical charge of Sukkur, in connection with the introduction of animal vaccination in Upper Scind.

Report by the Superintendent General of Vaccination, No. 168, submitting his remarks on the above.

Report by the Inspector General, Indian Medical Department, No. 2047, dated 23rd May 1871, stating that the success of the experiments made by Honorary Assistant Surgeon Leahy in animal vaccination is very gratifying, and that he considers him deserving of the acknowledgment of Government for his exertions in the matter.

RESOLUTION.—Government have much pleasure in acknowledging Dr. Leahy's successful exertions in introducing animal vaccination in Upper Scind, and are glad to observe that the Acting Collector has taken such a warm interest in the matter.

(True Extract.)

(Signed) F. S. CHAPMAN,

Chief Secretary to Government, Bombay.

Loss of human life and cattle from wild animals and poisonous snakes, and measures taken for their destruction, &c., &c.

TOWARDS the close of the year 1868, a scheme, submitted by Captain Rogers, of the Bengal Staff Corps, for the destruction of wild animals, and a suggestion made by the Foreign Department for the revision of the existing system of rewards for such destruction, led to a review of the losses occasioned from year to year, both of life and property, by tigers, panthers, wild elephants, snakes and other noxious animals all over the country, with a view to the determination of the best means that could be adopted for their extirpation. No single report or compilation was however extant which would give sufficient, if not complete, information on the subject,—accounts of the depredations committed in the several provinces by beasts of prey being scattered over a variety of documents, such as survey reports, general administration reports, applications for sanction to the offer of rewards, special reports of missionaries residing in the interior, &c., &c. But the few papers that could be collected at the moment were enough to convince the Governor General in Council that the annual loss of human life and of cattle, and the injury to crops caused by these scourges, were exceedingly great. Whole villages were at times completely depopulated; public roads and thoroughfares rendered literally unapproachable by human beings even in broad daylight; and thousands of acres of once

cultivated land were in consequence entirely deserted and consigned to the growth of brush-wood and rank vegetation, to offer in their turn safe coverts to these noxious animals, and enable them to do more havoc in the surrounding country.

It appeared from the Central Provinces Revenue Survey Report for 1867-68 that great obstruction was caused to the operations of the survey party by the depredations of tigers which infested the district where it was employed. A tigress was represented to have killed 127 people and stopped the traffic for many weeks on the road between Moolb and Chunda, until she was shot by Lieutenant Coddington. In the Topographical Survey Report of the Bengal Presidency for 1867-68 it was stated that "in the Central Provinces the Surveyor came across a tract which had been utterly devastated by a single tigress, which was estimated to have killed upwards of 50 people and was known to have driven the inhabitants away from 13 villages." Certain proceedings volumes of the Madras Government that were laid before the Governor General in Council also contained terrible accounts of the ravages committed by tigers, leopards, and other wild animals. A report by the Collector of South Canara, dated the 16th February 1868, stated: "The depredations caused by tigers and *cheetahs* have of late been somewhat serious in the district, and even the town of Mangalore itself is not free from their incursions. In the month of June 1865 it was reported that, during the previous twelve months, no less than sixteen human beings had been carried off in the Udipi and Candapore Talooks, and, in the rest of the district, the loss of life by this cause only was gradually on the increase. In addition to this the losses by the villagers of their cattle, goats, and pigs were in some localities very considerable." The Collector of Kurnool, under date the 9th October 1867, reported that, up to the end of September preceding, a man-eating tiger had carried off no less than 64 human beings, and had caused such a terror that the post runners and beat constables would not traverse the ghat until large numbers of persons collected together and procured numerous tom-tom beaters to accompany them, and that the coolies of the Public Works Department had stopped work through fear of attack by this tiger.

The proceedings of the Government of the North-Western Provinces were also not wanting in horrible accounts of ravages committed by wild beasts. A report by the local Board of Revenue, dated 7th December 1867, contained the following mournful narrative of the destruction of life caused by a single bear in a northern village bordering the forest.

"About midnight, whilst most of the cultivators were out watching their rubber crops, and there were only some fourteen or fifteen people in the village, a bear in the short space of two hours killed two men, three women and one child, also wounding two men. He first entered the house of one Ahmed Yar Khan, Pathan, and killed two women. He next destroyed Sobrattee Dhobee, who had come to the assistance of the women. He then entered the house of Elabi Buksh, butcher, and killed his wife and child. The husband attacked him with a knife, but the bear appears (from the investigation) with one blow to have torn away his head and face. On retiring from the village he attacked six head of cattle, three of which died before morning. The cries from the village attracted the attention of two of the cultivators, who, proceeding from their fields to ascertain the cause, met the bear a short distance outside the village. He immediately attacked them, wounding them both, but the wounds were not serious. The following night the animal entered the adjoining village of Pertabpore. He there entered the house of a "Rae" and wounded his wife; he then attacked the man and had succeeded in wounding him badly on the arm, when he was shot by a man named Waly Mahomed."

The police reports of some of the provinces showed that the Local Governments and Administrations were quite alive to the necessity of driving away these wild beasts from the vicinity of the habitations of men, and rewards were most liberally dealt out for their destruction. But enormous numbers of men, women, and children still continued to fall victims to their ravages year after year.

So early as March 1834 the Secretary of State had noticed the serious devastations caused by tigers, wolves, and other wild animals, and thought it not improbable that the failure of the handsome rewards offered for their destruction in producing the desired effect might be partly owing to the villagers having been deprived of their arms through the operation of the General Disarming Act. He therefore commended the subject to the consideration of the Government of India, and desired that, if deemed necessary, the inhabitants of those villages which suffered most from the ravages of wild beasts might be allowed to retain such arms as were absolutely necessary for the protection of themselves and their property. This despatch being circulated through the Government of Bengal to the several Divisional Commissioners in the Lower Provinces, a discussion took place as to the adequacy or otherwise of the authorized rewards, resulting in some cases to an enhancement of them. The Bengal Government also suggested to the Commissioners that strychnine might be used with advantage and without risk by being introduced into the body of a cow or other animal after it had been killed by a tiger. But nothing was said in the correspondence that ensued to lead to the conclusion that the operations of the Arms Act had in any way contributed to aggravate the evils complained of.

A separate correspondence was at this time going on with the Local Governments and Administrations on the subject of the Arms Act, from which it became abundantly manifest that the loss arising from the destruction of crops by wild elephants, pigs, &c., was very considerable.

Captain Rogers' scheme, referred to at the commencement of this memorandum, consisted of a contrivance devised by him, a sort of a spring-gun, already in use in many parts of the country. The main details of the invention are contained in the following paragraphs extracted from his letter :

"With regard to the weapon I propose the use of the old muskets that have merely a nominal value as iron, and are constantly being taken up and sold as such. * * *

"An adjustment attached to the trigger is the only expense, and this would not exceed four annas per musket.

"There are three strings attached to this trigger adjustment. The one marked A is the fatal one, and running along the barrel crosses the path these animals frequent, and is set at the height of the shoulder of the beast it is desired should be killed, and that string represents the line of fire. The bullet, therefore, invariably enters the most fatal part. It is a well-known fact that wild beasts do not wander as animals of the deer tribe do all over the jungle, but invariably travel by paths and roads through the jungle when going for food or water; and in the event of one being killed and another coming to the same district, the chances are ten to one that animal will use the same paths and roads and take up his quarters in almost exactly the same spot as his predecessor. Their haunts and walks are well known to every shikaree in the district, and it would be a matter easily determined as to where to set the gun, to ensure the animal's destruction before it had time to do much injury.

"To prevent destruction of animals that should not be destroyed, there are two other strings attached to the trigger, and these (marked B B) are laid at such a height from the ground as to allow a tiger or other animal it is wished to kill to pass underneath without touching.

"Cattle or persons coming in contact with these strings cause the gun to go off, and its fire is perfectly harmless."

Captain Rogers depicted in strong and vivid colors the immense and irreparable injury caused by wild animals in remote parts of the country, as will be seen from the following extract from his letter :

"By killing as they do these cattle, not only are the villagers losers, but also the Government in an indirect way.

"It is by these people—and these people again assisted by their live agricultural stock—that the vast jungles are becoming tracts of cultivated country, but the wild beasts greatly retard the same and act as a considerable check on the energies of those unfortunates, who are now, to a great extent, at the mercy of any tiger or other beast of prey that may take up its quarters in their district.

* * * * *

"No thefts or murders in India can exceed the horrors and misery caused by the wild animals, and no picture or language can give even a faint idea of the sufferings of their victims. Those poor creatures, living as they do, for the most part, in districts seldom or ever visited by any European except an occasional sportsman, are obliged to bear their losses or sufferings with little or no chance of the same being brought to the notice of the Government whose subjects they are.

* * * * *

"A short time since I would have scorned the idea of killing a tiger or other beast by stratagem, and would have felt the most supreme contempt for any English sportsmen doing so.

* * * * *

"I now look upon it in the light of a question involving the lives of hundreds of persons yearly, and, in a second and less serious light, as affecting the loss of cattle to the value of very many lakhs of rupees for the same period, and the same being almost entirely the only worldly property of thousands of half-starved creatures of a much more honest and truthful disposition than the inhabitants of the towns and villages in the immediate vicinity of our stations."

* * * * *

Captain Rogers would organize the shikarees of every district into regular bands with jemadars over them, and supply them with guns and ammunition, exempting these selected shikarees from the usual payment for licenses for their guns. He said that where bows and arrows were used by the natives, the same contrivance, as that suggested by him, would operate with fatal results in the destruction of wild animals. He would fix the reward at Rs. 8 only, "but never more, except under special circumstances, having no reference to the damage the tiger is doing, but to any extra trouble or injury the shikaree has sustained in killing it."

Captain Rogers further proposed that the skins of animals and their claws should become the property of Government. "These," he said, "will realize a large sum of money, and with a little management a number of valuable skins can be brought into the market; and a small sum being given for skins on which care had been bestowed would soon induce the natives to give them up in a better condition than at present."

As to accidents, Captain Rogers himself was not very hopeful. In fact, in saying "that accidents will and must happen," he seemed perfectly conscious that a material defect in his contrivance was that it would be as likely to kill a noxious animal as the bullocks and buffaloes belonging to the poor people intended to benefit.

At this time the Foreign Department forwarded, for consideration, along with Captain Rogers' scheme, copy of a correspondence with the Chief Commissioner of the Central Provinces, on the subject of the rewards offered for the destruction of wild animals and of poisonous snakes, together with a letter from Mr. Biss, Deputy Accountant General of those Provinces, recommending, with reference to the increasing expenditure on account of rewards for killing snakes, that municipalities should be required to pay for the destruction of snakes within towns, in order to secure that no rewards were given for snakes killed in the jungles. Another communication was received from the Foreign Department, which showed that it had been decided in the Financial Department, that the attempt to extirpate snakes by means of a reward had proved a failure in the Lower Provinces.

A circular* was accordingly issued ordering the discontinuance of rewards for killing venomous snakes, pending the issue of final orders on the general question of the destruction of noxious animals. As regards the general question, a copy of all the available papers with Captain Rogers' letter was forwarded to the Local Governments and Administrations, and reports called for showing, for the years 1866-67 to 1868-69,—

- (1) the loss of human life from the several kinds of wild quadrupeds;
- (2) the loss of cattle or crops from the same cause;
- (3) the number of various kinds of animals killed;
- (4) the system for their destruction at the commencement of the period, and any changes introduced during the three years;
- (5) the cost to Government of the measures adopted;
- (6) the operation of special systems or scales of reward (if any) tried in particular localities.

Opinions were also asked as to the measures which should be adopted in future, with special reference to Captain Rogers' proposals, it being added that no increased expenditure could at present be sanctioned in this matter. The Local Governments and Administrations were requested to give the same information regarding poisonous snakes as in the case of noxious quadrupeds, and, where rewards for the destruction of snakes had been once in force but were withdrawn, to show the result of the withdrawal.

Another circular was subsequently issued on a kindred question under the circumstances, and with the specific object described below.

In a communication dated the 25th August 1869, to the address of the Financial Department, already noticed above, the Deputy Accountant General of the Central Provinces wrote as follows, speaking of the enormous sums annually spent in rewards for the destruction of wild animals—

"4. Then, again, if we pay largely for the destruction of animals having handsome skins, it might be worth while to pay a little more, and by having them properly tanned, convert them into saleable goods. For instance, within the last four months, 50 tigers were killed in Raepore, costing Government Rs. 2,550. And as there is a school of art at Raepore, it would almost seem worth while to have marketable skins properly tanned there. There would be a good market for good skins at Nagpore, and there would be no cost of transit, as they could always be brought down by my treasure parties."

Precisely at this juncture, Captain Rogers forwarded a letter from one Mr. J. Rowland, Jubbulpore, offering to purchase these skins at a contract price, and applying for a monopoly "of all skins of wild beasts killed throughout India." He said that, provided the skins were delivered up in certain easily accessible towns, and in as perfect a condition

as possible, he could enter into a contract for paying for one year certain, renewable, if required, the prices noted below :

			Rs.
Tiger, <i>Cheetah</i>	}	...	10 each.
Panther or leopard		...	2 "
Bear ...		...	1 "
Wolf or hyena ...		...	1 "

This led to the issue of a circular* enquiring whether, under the present system of granting rewards for the destruction of wild animals, the skins of the animals killed became, in any case, the property of the Government, and if so, how they were disposed of.

* Dated 19th August 1870.

Replies have been received to both the above circulars. The following tabulated returns show the substance of those replies on the points specifically referred to in the circular of the 29th January 1870, and on the question put in the circular of the 19th August 1870. The suggestions made by the several Local Governments and Administrations regarding the method that should be adopted in future for the extirpation of wild animals and venomous reptiles, and their views on the important question generally, will be found summarized in the sequel.

ABSTRACT.

Loss of life in the three years of 1866-67, 1867-68, and 1868-69, from wild beasts and venomous snakes, and the amounts disbursed in rewards for killing them, mostly the former.

PROVINCE.	Killed by wild beasts.	Deaths from snake-bite.	Total number of deaths in the three years from both causes.	Amount spent in reward.
				Rs.
Madras	888	760	1,648	38,803
Bombay (exclusive of Sind, &c.)	148	588	736	19,679
Bengal	6,741	14,787	21,528	62,812
North-Western Provinces ...	2,168	2,474	4,642	18,474
Punjab	510	1,064	1,374	60,693
Oudh	569	3,782	4,351	10,728
Central Provinces	1,347	1,961	3,308	1,65,773
Coorg	147	Not given.	147	12,520
Hyderabad	129	226	355	14,273
British Burmah	107	22	129	2,000
GRAND TOTAL ...	12,554	25,664	38,218	4,55,755

It will be seen from the foregoing abstract that the total *reported* loss of human life in India in the three years of 1866-67, 1867-68, and 1868-69, from wild beasts and venomous snakes, was no less than 38,218* or 12,736 per annum; and that the expenditure incurred by Government in rewards for the destruction of noxious animals amounted to Rs. 4,55,755, or Rs. 1,51,918 per annum. Bengal appears to have suffered most, upwards of twenty-one thousand lives having been lost during the period, that is, nearly five

* Wild beasts	12,554
Snakes	25,664
Total	38,218

thousand more than the number lost throughout the rest of India. This certainly throws serious doubts on the accuracy of the returns from the other Provinces. Next to Bengal are the North-Western Provinces; Oudh, the Central Provinces, and Madras stand third, fourth, and fifth, respectively; British Burmah showing the least loss of all. As regards expenditure, the Central Provinces stand first in the list, having spent a lakh and sixty-five thousand rupees, that is, nearly three times as much as Bengal. Next to the Central Provinces stands Madras, where the expenditure amounts to eighty-eight thousand rupees. Bengal stands third in this respect, having spent only sixty-two thousand rupees; Punjab is fourth, and British Burmah has been the least expensive of all.

The loss of cattle and crops has also been, no doubt, large, although the returns do not contain full information on this point. In several parts of the country, the zemindars and the people themselves are left to take the necessary steps for the protection of cattle and crops; but no responsibility is anywhere attached to the former in this important matter.

The excessive expenditure in the Central Provinces may be, in some measure, owing to the extremely high scale of rewards prevailing in those Provinces. One hundred rupees for a "man-eating" tiger, and fifty rupees for a "full-grown" tiger, are not paid anywhere else. It may not be possible to secure uniformity in regard to the scale of rewards. But presumably the Government of India can, with great advantage, lay down a maximum limit for each species on a consideration of the rates prevailing in the different parts of the country, leaving it to the local Governments to propose higher rewards in the case of any specially destructive and dangerous animals.

None of the Local Governments suggest any specific measures for adoption beyond the system of rewards now in force; and almost all subordinate officers whom they have consulted agree in condemning Captain Rogers' mechanism as unsuited to the territory under their jurisdiction, or as dangerous and full of risk to human beings and domestic animals. For a brief analysis of the opinions given by the Local Governments, the reports may be divided into three heads—

- (1)—destruction of wild animals and Captain Rogers' plan,
- (2)—destruction of poisonous snakes, and
- (3)—disposal of the skins of the wild animals killed.

As regards the destruction of wild animals and Captain Rogers' plan, local officers in the Lower Provinces consider the system of offering rewards to be practically the best, and recommend no change in this respect. The Lieutenant-Governor thinks that much good would be done by encouraging local officers in Districts in which the loss of life and of cattle is great, "to organize at suitable seasons, and at a small expense to Government, large hunting parties to destroy the particular class of beast found to be destructive," as such a course would give the people courage, and incite them to organize similar hunts themselves, and also teach them to make a stand against a danger that is now destroying their substance and themselves. His Honor would also encourage the police to destroy noxious wild animals by allowing them the usual rewards. His Honor doubts whether Captain Rogers' plan "is not as dangerous to cattle and human beings as to the noxious animals it is intended to destroy." It is stated that the system of rewards is of no practical effect in Behar, owing to the prejudices of the people; but no special remedy is suggested, although it is admitted that in this District people suffer most from the ravages of tigers, &c. In such cases the point for consideration evidently is, whether a special scale of rewards should not be offered to tempt *shikarees* from other parts of the country, instead of suffering the poor people to fall victims to their own prejudices.

The Madras Board of Revenue considers it "the bounden duty of Government to do something for the destruction of wild animals, and the protection of life and property from their ravages," but does not think it necessary to depart from the present system of rewards. The Board condemns Captain Rogers' scheme as unsuited to the circumstances of that Presidency, in which the people have not been disarmed, and in which, wherever there are jungles, there are numerous *shikarees* of different races and families, who are naturally impatient of control, and could never be brought to submit themselves to a jemadar. Besides the *shikarees* know how to set spring guns. The Government of Madras concurs in the above opinion. It has requested the Board of Revenue to arrange for reports by heads of villages to the nearest police station of the loss of human life, cattle, and crops, and has called for its opinion whether it may not be desirable to authorize Tehseeldars to disburse the rewards at once, under certain restrictions, as to amount, instead of requiring that the cases shall be sent up to the Collector or District Officer for disposal.

The views of the Bombay Officers are equally strong against Captain Rogers' plan. The Revenue Commissioner of the Northern Division remarks that "Captain Rogers' plan is universally disapproved by every one consulted on the subject. It appears to be known in the Districts, but only rarely resorted to." He thinks the plan in use of destroying a

beast by poisoning the carcase of an animal killed by it is so simple and sure that there is no need for further improvement in this way. He adds—"So far from tigers being on the increase in this Division, it is complained by the District Officers that the country is gradually denuded of big game, and there is nothing left to shoot." The Bombay Government agrees in the above opinion of Captain Rogers' proposals, and states that the measures hitherto adopted have been, on the whole, fairly successful and need no modification.

The Government of the North-Western Provinces writes. "Upon the whole, the Lieutenant-Governor is of opinion that the existing system answers well, and no material alteration need be recommended. Wherever there is any unusual prevalence of destructive animals, His Honor considers that the Government should have authority, as within budget limits it already possesses, to increase the rates of reward for their destruction. And where individual animals become notorious as occasioning loss of life, such as man-eating tigers and rogue elephants, liberal rewards should be offered on special parties organized for killing them." His Honor does not approve the adoption of Captain Rogers' plan. The use of poison is recommended by some officers, but it does not appear to have been anywhere adopted. His Honor considers that there is obvious danger in a resort to this practice, and is, therefore, unable to recommend its indiscriminate adoption. But he does not explain what that danger is. The Superintendent of Dehra Doon strongly advocates the plan of putting strychnine in the carcases of animals killed and left by tigers before they come back to eat them.

The Lieutenant-Governor of the Punjab agrees with the conclusion arrived at by a majority of local officers that the existing system of rewards is sufficient, and no change is desirable. Captain Rogers' plan is generally pronounced to be unsuitable to the Punjab. His Honor writes that it is a known and undisputable fact that the number of wild animals is rapidly decreasing in the Punjab, and that, if their destruction proceeds at the same rate as at present, the more dangerous animals will at no distant date be altogether exterminated. The chief cause of this diminution, he thinks, is the rapid increase of the population, and the immense extension of cultivation in the Province, which has reclaimed vast tracts formerly covered with jungle, and affording shelter to wild beasts.

It will be noticed that the Punjab Government "does not directly stimulate the destruction" of animals whose depredations are confined to crops, being of opinion that "the peasants may reasonably be expected to guard their own fields."

The Chief Commissioner of the Central Provinces disapproves Captain Rogers' plan as altogether unlikely to secure the object sought. He observes that if *shikarees* cannot now be had in numbers sufficient to keep down the wild animals, it is not likely that more men will adopt the profession when a license tax is levied on them, and when the rewards obtainable for killing the more dangerous animals are very much reduced. He is of opinion that the system of rewards promises better results than any other plan, and he would not recommend the introduction of any change. Spring guns, traps and nets may be and are used by persons who adopt hunting as a calling, and the Chief Commissioner does not think it necessary for Government to employ a set of men for trying to kill wild animals with any particular kind of weapon. He says—

"If the rewards now paid by Government are high, then many persons will be induced to adopt hunting as a profession. Many animals will be killed; and the more killed, the fewer will remain, and these fewer will become more difficult to find; the number of animals killed will decrease, and with it naturally the expenditure of Government. The high reward will thus result in the more speedy extirpation of these animals. But for Government to take upon itself the task of ridding the country of noxious animals, and employ a body of men for this purpose, forbidding other men to follow a hunter's calling, would be, in the Chief Commissioner's opinion, a mistaken measure."

In the Central Provinces also, the destruction of animals dangerous to crops is left to the people themselves, the measures of Government being confined to those that are dangerous to human life.

The Oudh and British Burmah authorities also support the existing system of offering rewards, and do not consider any other measures requisite.

The Resident at Hyderabad approves the existing system of offering rewards, and does not consider any change necessary. The Deputy Commissioner of Booldannah says that, in the last few years, the wild animals are becoming much fewer in number, and that such an animal as a tiger will before long not be heard of in that District; he thinks Captain Rogers' plan to be a "dangerous one, and more likely to lead to the death of cattle and human beings than of tigers."

The officers consulted by the Chief Commissioner of Coorg are of opinion that the continued payment of rewards, at an increased scale, will effect the gradual extirpation of the most dangerous and destructive class of wild beasts. The Chief Commissioner concurs

in this view but says that, "in certain localities, so as to effect the destruction of particular animals, some of Captain Rogers' suggestions might be adopted with advantage." He, however, does not specify the suggestions.

As regards snakes, although the number of deaths from this preventible cause is exceedingly large—more than double of the mortality from the depredations of wild animals of all kinds taken together,—yet the Bengal Government considered it expedient to discontinue of its own motion the grant of rewards for killing poisonous snakes in the only District in which it was ever allowed. The logic of its argument that, because the people were ready enough to kill snakes, and even to bring them from the jungles for the sake of a reward, they will do so for their own sakes without a reward, is not at all clear. A man may kill a snake now and then, when he meets one; but the question is, whether such occasional destruction at the will or caprice of particular individuals will be sufficient to effect any sensible diminution in the number of poisonous snakes, or to extirpate them from the habitations of men. The Bengal Government simply says that the offer of rewards does not answer the real object in view, without explaining in what particular respect it has failed.

The Madras Board of Revenue considers it desirable that the prohibition against granting rewards for killing venomous snakes should be removed, and the Local Government concurs in this opinion.

In the Bombay Presidency the Commissioner of the Southern Division does not think the grant of rewards for the destruction of snakes to be necessary. The Commissioner of the Northern Division on the other hand says:

"Death from snake-bites is far more to be dreaded and guarded against than the ravages of wild beasts. Rewards for the destruction of the latter are at present held in abeyance; but when the restriction is removed, it will be advisable to offer a scale of rewards for the destruction of snakes rising from half an anna for ordinary snakes to two annas for cobras, phooras, and other highly venomous kind."

In the North-Western Provinces the loss of life from snake-bite is enormous, though not so heavy as in Bengal. Nearly 2,500 men died premature deaths from this cause alone during the three years under report. But except in the District of Humeerpore, no rewards were ever offered for killing these dangerous reptiles. Even in that District the offer of reward was withdrawn after two or three months' trial, the local officers being of opinion that "it is of no use to offer rewards for destroying snakes. Their slaughter, when met with, is too easy, and the impulse to kill them too instinctive to need artificial stimulus." The Lieutenant-Governor does not believe that any sensible diminution can be effected in the number of snakes by any system of rewards. He would not offer any rewards, because they are already pursued as the natural enemies of the human race whenever they show themselves by all excepting the few who are withheld from injuring them by religion. But it appears to be forgotten that, although followed, "as natural enemies of the human race, and easily slaughtered when met with," yet nobody will devote his time to search out a snake, or take any trouble to kill it when met with, unless it were in the hope of earning a reward. As in the case of wild beasts, the existence of a system of rewards gives birth to a race of professional hunters, so in the case of snakes such a system would create a race of snake-catchers, who would make it the business of their lives to search out and destroy these natural enemies of human life.

No rewards have ever been offered in the Punjab for the destruction of snakes, although "for every person killed by wild beasts five die from the bite of snakes." The majority of the local officers consulted are opposed to the grant of rewards. But the Lieutenant-Governor is disposed to think the experiment worth trying. He writes:

"The reason urged against the grant of a reward, *viz.*, that snakes are already destroyed without reward, wherever found, is not of much force; for, as a matter of fact, the natives are generally very superstitious on the subject of snakes, and are very unwilling to kill them. The number of deaths from snake-bites is so large that, if there appear any reasonable hope of checking the mortality, it would be the clear duty of the Government to attempt to do so. The Lieutenant-Governor's experience in Oudh leads him to hope for success in this direction, and he would willingly give the experiment a fair trial."

Nearly two thousand lives were lost in the Central Provinces from snake-bite during the three years under report. But the Chief Commissioner sees little chance of any scheme being devised whereby more snakes would be killed than at present. His reasons are similar to those advanced by others who are of the same opinion with him. "Snakes are only dangerous in the haunts of men, and, when seen, they are, as a general rule, at once killed." Officers who are of this opinion necessarily ignore the deep-rooted and universal superstition prevailing among the natives on the point of snake-killing, except among certain lower castes inhabiting particular localities, such as *Domes* in Lower Bengal.

The Oudh report states that "it is clear that, without payment, the professional snake-killers will not kill snakes."

The Chief Commissioner of British Burmah advocates the introduction of rewards for killing snakes, and recommends a scale for the sanction of Government.

The Hyderabad officers deprecate the discontinuance of rewards. The Commissioner of East Berar proposes a scale for sanction, and the Resident supports his recommendation.

In Coorg certain municipalities grant rewards for the destruction of venomous snakes; and the Commissioner of Astagram recommends that where these reptiles abound, and where there are no municipalities, the Government should give rewards from the imperial revenues. The Chief Commissioner is of opinion that the scheme might be adopted as an experimental measure.

As regards skins. It will be seen from the foregoing tabular returns that, at some places, it is the practice to take over the skins of the animals killed at the time of awarding the rewards, and dispose of them to the best advantage, crediting the proceeds to the imperial revenues. But thus locally disposed of, the income derived from the sale is admittedly very trifling. At others again, those skins are allowed to remain with the *shikarees* themselves as a portion of their reward, or are thrown away as of no value whatever. Where the *shikarees* are allowed to appropriate the skins, they do not seem to attach much value to them, and the consequent increased inducement to kill wild animals is very slight indeed. It may be noted that one important and valuable end which the appropriation of the skins in behalf of Government would serve is that it would afford a check upon the disbursement of rewards by the mofussil police and revenue officials. No uniform rules appear to exist for ensuring that the amounts debited to the account of wild beasts should be in reality devoted to that end, instead of being misappropriated by the subordinates of the departments entrusted with the duty of awarding these rewards. At some places, the officers in charge of the mofussil police stations are allowed uncontrolled authority in the disposal of the available funds. At others, the rules require application to be made to the higher authorities at the sudder station. Frauds have often been discovered in the Bombay Presidency in the distribution of rewards for the destruction of wild animals, and the last one was of the most wholesale description imaginable.

The following extract from the Proceedings of the Bombay Government, connected with a recent case of fraud, will show to what extent funds assigned by Government for the destruction of noxious animals are capable of being misappropriated under the existing system :

"A most impudent fraud has been practised.

"2. It appears that the average annual payments for the destruction of wolves in the Seerpore Talook of Khandeish was Rs. 390; whereas, from the 31st March to the 21st May 1869, no less a sum than Rs. 3,381 was paid on this account. Of this sum Rs. 581 was disbursed by order of the Mumlutdar Suddashiv Gopal between the 31st March and 23rd April. On the latter date the mamlutdar went on leave, and the Head Karcoon, Luximon Janardon, took charge. Between then and 21st May he managed to pay away Rs. 2,800. The fraud was then discovered.

"3. The following extract from the Report of the Collector and Magistrate shows the barefaced manner in which this system of robbery was carried on :

"There is reason to believe that no trouble was taken to procure even a few wolf skins to give color to the fraud; for, of the 45 skins which were seized when the fraud was discovered, and for which an order had actually been written on the treasury to pay the rewards, there is not a single wolf skin. They consist of village cat skins, fox skins, jackal skins; and it is probable that the whole of the rewards were paid on this lot of skins brought up over and over again, some of them having been torn across and sewn up again."

"4. The rules for payment of rewards require that the skins should be accompanied by a report from the village officers, stating that the bearer had killed the animals in question, and was entitled to the reward. An examination of the skins has also to be made by a *punchayet* or jury. These rules were duly observed, but false reports were received from the villages; and any person who happened to be present in the kutchery was made to go through the form of signing the report of the jury."

The opinions of the Local Governments on the point are based upon the insignificant sums that skins now fetch if sold at the local markets, and this is distinctly stated in the reports of some of them. For instance, the Lieutenant-Governor of Bengal says, that "the revenue derived from the sale of skins must be very trifling," and, therefore, recommends that they may be left in the possession of the *shikarees*. The Lieutenant-Governor of the North-Western Provinces remarks that the skins "are probably more valuable to the *shikarees* than to Government, as the former has better opportunities of disposing of them."

No. 4202.

*Extract from the Proceedings of the Government of India in the Home Department (Public),—
dated Simla, the 11th September 1871.*

READ again the under-mentioned correspondence on the general question as to the best means of securing the destruction of noxious animals and poisonous snakes, and on the present practice of disposing of the skins of such animals :

From Foreign Department, No. 1958, dated 30th September 1869.
From " " " 2291, " 25th November "
From " " " 2380, " 6th December "
To " " " 5576, " 16th "
From " " " 29G, " 6th January 1870.
From Financial Department, No. 4137, dated 18th October 1869.

From Captain B. Rogers of the Bengal Staff Corps, dated 9th August 1869, submitting a scheme for the destruction of noxious animals.

Home Department Circular, No. 636—47, dated 2nd February 1870, directing the discontinuance of rewards for killing poisonous snakes pending the issue of final orders on the general question.

Home Department Circular, No. 600—609, dated 29th January 1870, calling for reports upon the loss of human life, cattle, and crops from the several kinds of wild animals and venomous snakes for the past three years, and the number of such animals and snakes killed during the same period, and the cost entailed thereby on the State ; and requesting Local Governments and Administrations to give their opinion on the scheme submitted by Captain Rogers, and on the system that should be adopted for attaining the object in view, and to state the result of the withdrawal of rewards for killing snakes.

Reply from Madras, No. 137, dated 21st January 1871.
" " Bombay, No. 2760, dated 14th November 1870.
" " Bengal, Nos. 5512 and 1031, dated 17th December 1870, and 8th March 1871.
" " North-Western Provinces, Nos. 174 and 3621, dated 27th May and 18th August 1870.
" " Punjab, No. 234, dated 3rd February 1871.
" " Oudh, No. 4213, dated 24th August 1870.
" " Central Provinces, No. 1259—136, dated 19th May 1870.
" " British Burmah, No. 80—38, dated 7th March 1871.
" " Mysore and Coorg, No. 2320, dated 23rd July 1870.
" " Hyderabad, No. 41, dated 5th July 1870.

Demi-official Note from Captain Rogers, to the Private Secretary to the Viceroy, dated the 25th July 1870, with a letter from Mr. Rowland of Jubbulpore, enquiring whether he could obtain a monopoly for the purchase of the skins of all wild beasts killed throughout India on the terms described in that letter.

Home Department Circular No. 3835—44, dated 19th August 1870, requesting information whether, under the existing system of granting rewards for the destruction of wild animals, the skins of the animals killed become in any case the property of the Government ; and, if so, how they are disposed of.

Reply from Madras, No. 137, dated 21st January 1871 (paragraph 8 of Board's Report).
" " Bombay, No. 2787, dated 16th November 1870.
" " Bengal, No. 5518, dated 17th December 1870.
" " North-Western Provinces, No. 1543, dated 30th November 1870.
" " Punjab, No. 430, dated 25th February 1871.
" " Oudh, No. 4877, dated 30th September 1870.
" " Central Provinces, No. 2909—310, dated 11th November 1870.
" " British Burmah, No. 80—9, dated 4th November 1870.
" " Coorg, No. 383—43, dated 29th August 1870.
" " Hyderabad, No. 73, dated 11th November 1870.

RESOLUTION.—The papers now before the Government of India conclusively establish the fact that the evil under consideration is a very serious one. The loss of life, though probably not quite accurately reported, is certainly enormous. Nowhere is the destruction of life by wild beasts so great as in the Lower Provinces of Bengal. In other Provinces, as cultivation and civilization have advanced, wild beasts have diminished in number. In the Punjab and in most parts of the Bombay Presidency, the presence of the more dangerous species is now stated to have become exceedingly rare.

2. In the opinion of the Governor General in Council this serious mortality could be very largely reduced by the extirpation of those animals in the neighbourhood of human habitations. This should be first attempted and every reasonable means taken to secure their destruction whenever they make their appearance near towns or villages. The system of rewards hitherto in force in all Provinces seems to be the most effective means by which the Government can accelerate the work, and Local Governments and Administrations are empowered to increase, within the limits of their respective budget allotments, the rate of the authorized rewards, whenever such a measure is considered desirable ; but rewards should only be given for killing destructive and not merely wild animals.

3. As regards snakes, it seems to be overlooked by many officers that there is a deep-rooted prejudice among most natives against killing a snake—a prejudice which nothing but the offer of a reward will overcome. And as deaths from snake-bite are extremely numerous, the Governor General in Council has no doubt that the recent prohibition against the grant of rewards for killing snakes should be partially withdrawn, and that rewards not exceeding two annas a head, as a general rule, should, at the discretion of the Local Governments and Administrations, be offered for snakes known to be deadly, that is, the cobra and some other species to be expressly named. But such rewards should not be offered throughout a whole Province or for an unlimited period, but in selected Districts, where the mortality from snake-bite is greatest, and for a period not exceeding two years. At the end of this period the result of the experiment should be reported to the Government of India, in order that if successful, the propriety of extending it may be considered; and it is clear from the correspondence that care should be taken that no reward be given without the snake, when killed, being seen by the officer who grants the reward, and that the head of every such snake should be cut off and destroyed as soon as the reward is given.

4. Although it is not desirable to grant a monopoly for the purchase of the skins of the wild animals killed for rewards, or in any way to commence a traffic in them, yet it is proper for the district officers to exercise an effectual check on the disbursement of rewards by subordinate officials, where the work is entrusted to such officials. Whenever *shikarees* are allowed to appropriate the skins of animals, precautions should be taken to prevent the same skins being shewn twice. The correspondence shows the necessity of care in this respect to prevent fraud, especially in the case of animals for which the lower rates of reward are offered.

5. As to Captain Rogers' scheme, it has been generally considered as impracticable; but he deserves thanks for the interest he has taken in the matter.

ORDER.—Ordered, that a copy of this Resolution be forwarded to the several Local Governments and Administrations for information and guidance.

Ordered, that a copy of this Resolution be forwarded to the Financial and Foreign Departments.

Ordered also, that the above Resolution be forwarded to Captain Rogers, with reference to his letter dated the 9th August 1869.

(True Extract.)

E. C. BAYLEY,

Secretary to the Govt. of India.

GOVERNMENT OF INDIA.

DEPARTMENT OF AGRICULTURE, REVENUE, AND COMMERCE.

Reports on the state of the season and prospects of the crops.

GENERAL REMARKS.—On the whole, the latest intelligence received shows an improvement on the state of things portrayed in the reports published a fortnight ago.

In West Berar the timely rain-fall has 'saved the harvest;' in Mysore prospects are 'decidedly' improved; in the North-Western Provinces and Oudh they are not such as to cause anxiety, though in parts injury has been done by excess of rain. Want of rain, on the other hand, has been greatly felt throughout a considerable portion both of the Bombay Presidency and of the Punjab; and the food crops in those tracts will, it is feared, be scanty. The cotton crop in Bombay is, however, promising.

In Bengal, except in the Presidency Division where the inundation has caused much damage both to the *aus* and *aman* rice crops, the loss from floods is not so great as was feared, and no general distress is apprehended.

In the Central Provinces and in Central India the prospects are favourable. In Rajpootana they vary much from State to State according to amount of local rain-fall.

From British Burmah the report is not discouraging.

The latest details are given in full below.

No.	Presidency or Province.	District.	Date of District report.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
	BRITISH BURMA	.....	.....	*	September 7	.....	* Rain-fall excessive this year: heavy floods and consequent partial destruction of crops; land being re-sown in some places. Extent of injury cannot be estimated for a few weeks. No fear of famine under any circumstances. Rice cheap.
	BOMBAY	West Berar { Akola	Sept. 13	3	"	Rain just in time to save the harvest. There are prospects now of a middling outturn. More rain is still required to fill the wells and thoroughly saturate the soil.	The rain-fall during the preceding fortnight has been general, but very much less in some places than others. Maximum rain-fall 6.28 inches, minimum 1.84 inches, average 3.74 inches.
	.....	Buldana	"	3.83	"	Prospects promising, but more rain is wanted.	
	Ditto	East Berar	"	5.5	"	Rain ample but not superabundant. Cotton and grain crops excellent.	
	.....	Bangalore	"	2.27	"	Crops generally thriving	
	.....	Mysore	"	2.57	"	Condition of crops improved since last report.	
	.....	Coorg	"	7.13	"	Crop prospects favorable.	
	.....	Lucknow	"	2.9	"	Kharif prospects favorable; rabi ploughings vigorously carried on. Heavy rains destroyed sugar-cane in Malabad Taluk.	South-West monsoon still prevails. Rain-fall, though light, has been general. Agricultural prospects decidedly improved within last fortnight.
	.....	Fyzabad	"	9.9	"	Considerable damage by rain to crops in low lands. Rabi ploughings stopped. Break much wanted.	There has been too much rain. Kherree, Fyzabad, Baraitch, and Gonda have suffered most, the latter also from heavy floods of Rapti. In other Districts, codo, juar, makra, jarhan, and sawan, on low lands have suffered. Early rice, kodo, kakun, sawan, urd, makra, and bhadoin are being cut.
	.....	Benares	.....	4.9+	"		+ Heavy showers every day, but their effect modified by sun and wind.
	.....	Allahabad	.....	2.5	"		Prospects generally fair, but injury from excessive rain still complained of.
	.....	Agra	.....	4	"		In Benares and Agra kharif crops much damaged, and ploughing for rabi crops delayed. In Bareilly and Meerut ploughing going on steadily, but kharif will not be above average.
	NORTH-WESTERN PROVINCES	Bareilly	.....	2.2	"		
	.....	Meerut	.....	6	"		

CENTRAL INDIA	Indore	September 13	7-01	Health tolerably good though fever is somewhat prevalent.
PUNJAB	Gwalior	"	4-9	Crops favorable. Wells and tanks nearly full. Prospects for wheat and optimum sowing good. Fair weather required to bring on mukka.
	Western Malwa—Rutlam	"	5-72	Juar crops dwarfed.
	Neemuch	"	3-01	Agricultural prospects good, but will suffer if rain continues.
	Baghelkhand { Sutna Nagode Sohawal	"	4-3 7 *	Prospects of crops favorable.
	Delhi	"	0-6	Agricultural prospects good.
	Umballa	"	0-4	Crops nearly ripe and excellent, except millet which insects have damaged.
	Jullandhur	"	1-0	Harvest prospects good, but rain wanted.
	Lahore	"	Nil.	Crops below average; prospects of spring harvest poor.
	Mooltan	"	Nil.	Unirrigated crops totally lost. Grass for cattle scarce. Bari Doab Canal water only reached Southern part of the District after long stoppage. Inundation canals closed from commencement of present month.
		"		Harvest prospects in Tehsils Mooltan and Serai Sidhee good, except on unirrigated high lands. In Shujabad outturn expected to be one-fourth less than last year. In Mylsle agricultural prospects so far good, but canals have dried, consequently cotton, juar, bajra, and til may suffer.
SIND	Rawul Pindas	"	4-0	Agricultural prospects good.
	Peshawur	"	1-1	Kharif outturn expected to be two-thirds of an average one.
		" 14	†	Agricultural prospects excellent. Kharif crops ripening well.
BOMBAY	Ahmedabad	" 13	1-98	Prospects good.
	Dharwar	"	5	The crops had revived from the rain which fell on 28th and 29th ultimo, but are withering again. Rain much wanted. There is but little drainage water in the tanks.
	Khandeish	"	1-95	Prospects bad.
				* Rain heavy; quantity uncertain. General health good.
				Rain much wanted throughout the greater part of the Province. The out-turn generally on unirrigated high lands will be poor. Agricultural prospects appear best at Delhi and Umballa.
				† No rain since last report. Indus now falling; height to-day above datum 14 feet 9 inches. Districts healthy. No cattle disease, but great scarcity of fodder.

No.	Presidency or Province.	District.	Date of District reports.	Rain-fall for fortnight preceding.	Date of message from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
	BOMBAY,—concluded.	Poona	Sept. 13	5.27	September 14	.....	In four Western Districts kharif crops generally good, in four Eastern Districts sowing of rabi commenced in few villages. The prospects of the cotton crop in Guzerat are improving and good; in Khandeish favorable, and in Sind. Healthy in all Collectorate, except Hyderabad. Prospects in Sholapore improved since recent rain-fall.
		Patna Division	"	...	"	Better reports received from the interior regarding rice crops than were anticipated. No cause of anxiety at present. Some local distress is only apprehended in Sarun.	
		Dacca	"	3.1	"	Prospects of the crops very good. River is again rising. In Furreedpore sugar-cane crops damaged.	
		Burdwan	"	*	"	Crops good. Ous much damaged. In Hooghly and Howrah crops in low lands partially destroyed.	* Rain-fall excessive.
		Cuttack	"	5.2	"	Prospects very good.	
		Bhangulpore,	"	...	"	Prospects of crops generally good, except in Monghyr, where bhadoi has been nearly half destroyed and amun partially injured. Water subsiding at Purneah.	
	BENGAL.	Rajshahye	"	...	"	In Moorshedabad river falling fast. A great part of the amun crop destroyed. In Maldah and Pubna also the crop has been much injured.	Prospects generally not so bad as was feared. General distress not apprehended.
		Presidency	"	...	"	Great loss to ous and amun in Jessore, also in Nuddea, and in the Buxserhant Sub-Division, 24 Pergunnahs. The inundations have actually spread over more than half the entire area of Nuddea.	
		Raipore	Sept. 9	2.5	"	Prospects of an ordinary kharif harvest more assured. Crops on high lands only somewhat backward. Preparations for rabi sowings advancing. Cattle disease in two Tahsils. Prospects in Bilas-	

